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H. Greene

1991-1998

Catalogue #2147-3130

Journal

- 1991 Arizona: Pima, Cochise Cos.
Calif: Contra Costa, Siskiyou Cos.
Costa Rica: Santa Rosa Nat. Park, La Selva B. S.
Arizona: Cochise Co.
New Mexico: Hidalgo Co.
- 1992 Arizona: Cochise, Pima Cos.
Calif: San Bernadino Co.
- 1993 Arizona: Cochise Co.
- 1994 Calif: Contra Costa, San Joaquin Cos.
Temperature/humidity tables
- 1997 Hong Kong
Vietnam: Tam Dao
- 1998 Arizona: Cochise Co.

[illegible]

Greene, H.
1991

Catalogue

- March 27 Cave Creek Canyon, Chiricahua Mtns., Cochise Co., Arizona
2147 Crotalus molossus DOR coll. B. Torberlin, Fall, 1990
200 m W. Portal Rd. on Paradise Rd., Cochise Co., Arizona
2148 Crotalus molossus shot by road worker, September, 1990 coll. B. Torberlin
4.2 mi NW of State line on Portal Rd., Cochise Co., Arizona
2149 Salvadora hepalepis DOR coll. B. Jennings, September 23, 1990
Base of Madera Canyon, Santa Rita Mtns., Pima Co., Arizona
2150 Masticophis bilineatus DOR coll. B. Jennings, July 18, 1990
1.0 mi SW Apache on Hwy 80, Cochise Co., Arizona
2151 Pituophis melanoleucus coll. B. Jennings, September 4, 1990
June 4 Between Granite Mtns. & Kelso Dunes on Kelbaker Rd., San Bernardino Co., California
2152 Crotalus cerastes HOR #2130h, ~ May 30, 1990, coll. R. Reed
July 7 La Selva Biological Station, Heredia Prov., Costa Rica
2153 Thecadactylus rapicandus
2154 Bufo marinus 6.8g regurgitated by Leptodeira septentrionalis (released) ^{~2245 hr. 20.7g SVL + 140mm ♀}
July 12 La Selva Biological Station, Heredia Prov., Costa Rica
2155 Micrurus muciocinctus found dead on path after dark
July 24 Grecia, Prov. Alajuela, Costa Rica
2156 Micrurus muciocinctus urban garden, May, 1991; possibly killed elderly woman
2157 Imantodes inornatus found dead June, 1991
La Selva Biological Station, Heredia Prov., Costa Rica
2158 Tantilla melanocephalus active in litter ~ 0630 hr ^{July 22, 1991} 273 + 90 mm, 6.0g
July 25 La Selva Biological Station, Heredia Prov., Costa Rica
2159 Azalychnis calcarifer tadpole coll. W.E. Roberts, July, 1991
2160 Azalychnis calcarifer tadpole "CCL 750 site"
2161 cf. Rana palmipes lot of ~20 tadpoles coll. W.E. Roberts, July, 1991

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Greene, H.

1991

July 26

2162 Typhlops sp.?

2163 Porthidium ophryomegas

2164 Porthidium nummifer

2165 Porthidium nummifer

August 3 7.1 mi SW of State Line Rd. on Hwy 80, Cochise Co., Arizona

2166 Crotalus scutulatus AOR 1945h 652+32mm, 160g

August 4 1.7 mi E. Portal on Portal Rd., Cochise Co., Arizona

2167 Pituophis melanolencus AOR/DOR 1927h 1216+145+?mm, 475g

2168 Pituophis melanolencus AOR/DOR 1927h 1362+181mm 760g

August 5 ~2 mi E. Portal on Portal Rd., Cochise Co., Arizona

2169 Crotalus scutulatus AOR/DOR ~2015h coll. T. Snell 790+60mm 315g

6.8 mi W. Animal on Hwy 9, Hidalgo Co., New Mexico

2170 Crotalus atrox ^{June 29, 1991} DOR 0848h MST coll. W. Sherbrooke, G. A. Middendorf, L. Beatty

Between Sunny Flat & South Fork, Cave Creek Canyon, Chiricahua Mtns., Cochise Co., Arizona

2171 Crotalus molossus AOR/DOR coll. Sarah Schmidt, April 17, 1991

August 13 Granite Gap, 10.3 mi S. Hwy 10 on Hwy 80, Hidalgo Co., New Mexico

2172 Crotalus molossus AOR coll. T. A. Snell, August 12, 1991, 2059h, 2228g ^{725+56mm, sat saved}

2173 Crotalus molossus DOR coll. T. A. Snell, August 12, 1991, 2059h, 1070+77mm

2.1 mi W. State Line Rd. on Portal Rd., Cochise Co., Arizona

2174 Hypsigena torquata AOR 2113h, August 12, 1991

Hwy 533, between Hwy 80 and State Line Rd., Hidalgo Co., New Mexico

2175 Heloderma suspectum DOR 0530h, coll. D. West, August 8, 1991

3 mi. E. Hwy 80 on Hwy 9, Hidalgo Co., New Mexico

2176 Salvadora DOR coll. D. West, August 11, 1991 ^{certainly Cnemidophorus}

Greene, H.
1991

- August 13 3 mi. E. Portal on Portal Rd., Cochise Co., Arizona
2177 Masticophis flagellum DOR coll. B.R. Torberlin, November 13, 1990
Near Portal, Cochise Co., Arizona
2178 Thamnophis cyrtopsis DOR, coll. B. Torberlin, August 12, 1991
2.2 mi. N. Hwy 533 on Hwy 80, Hidalgo Co., New Mexico
2179 Rhinocheilus lecontei DOR T.A. Snell, August 8, 1981
Antelope Pass, Hidalgo Co., New Mexico
2180 Gyalopion canum scat only, snake released, ^{coll. B.R. Torberlin} July 28, 1991
August 14 4.4 mi NE Hwy 666 (south) on Hwy 10, Cochise Co., Arizona
2181 Masticophis flagellum AOR/DOR 0933 hr.
10.1 mi E. Hwy 80 on Hwy 9, Hidalgo Co., New Mexico
2182 Crotalus viridis AOR 2046 hr 713 + 61 mm, 318 g
1.3 mi E. Hwy 80 on Hwy 9, Hidalgo Co., New Mexico
2183 Crotalus scutulatus DOR (fresh) 2107 hr.
August 15 Limestone Mtns. 2 mi NW Portal on Paradise Rd., Cochise Co., Arizona
2184 Urosaurus ornatus coll. S.R. Zamudio
Jct. Portal Rd. & State Line Rd., Cochise Co., Arizona
2185 Tantilla nigriceps AOR 2049 hr.
Portal, Cochise Co., Arizona
2186 Trimorphodon biscutatus AOR 2125 hr
August 17 Near Scotia Canyon, Huachuca Mtns., Cochise Co., Arizona
2187 Crotalus willardi active 0830 hr. el. 5700' 310 + 29 mm, 32.2g
(+19.2g woodrat remains)
2188 Crotalus willardi active 0915 hr. el. 5700' 526 + 57 mm, 149.8g
August 19 2 mi NW Portal on Paradise Rd., Cochise Co., Arizona
2189 Thamnophis cyrtopsis AOR 0900 hr. 482 + 172 mm 34.5g
2.5 mi E. Portal on Portal Rd., Cochise Co., Arizona
2190 Masticophis flagellum DOR 1600 hr.

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1991

August 19 Antelope Pass, Hidalgo Co., New Mexico

2191 Bufo debilis

2192 Bufo debilis

September 28 Indian Creek Canyon, Guimaraes Mtns., Hidalgo Co., New Mexico

2193 Lampropeltis pyromelana 602 + 111 mm, 87g + 6.2g ^{snake released, rodent saved - cf. Peromyscus} preg remains

vica. Portel, Cochise Co., Arizona

2194 Crotalus scutulatus born in captivity September, 1991, deformed

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1992

Catalogue

- March 7 33 mi W. of Portal on rd. to Paradise, Cochise Co., Arizona
2195 unidentified snake vertebrae
- 2196 Elaphe hiaspis coll. B. Tomberlin, ^{May} ~~Oct~~ 1991
≈ 2 mi. W. Portal on rd. to Paradise, Cochise Co., Arizona
- April 4 Coral Hollow Rd., San Joaquin Co., California
2197 Lampropeltis getula AOR/DOR 1829hr.
- May 13 10.0 mi. E. Newberry Springs on Natl. Trails Hwy, San Bernardino Co., California
2198 Salvadora hexalepis DOR (fresh) at edge of Pisgah Lava Flow, 1958hr ^{466+114mm}
- May 14 1.6 mi. E. of I-40 on Water Rd., San Bernardino Co., California
2199 Hypsiglena torquata under Yucca log 273+60mm
- 2200 Chiricahua Mtns., 0.5 mi W. Cave Creek Rd. on Paradise Rd., Cochise Co., Arizona
Crotalus molossus DOR 0710hr. 754+54mm, 202g ^{coll. D.L. Hardy} Sept. 1, 1991
- 2201 Chiricahua Mtns., ≈ 2 mi N. Galeyville on San Simon Rd., Cochise Co., Arizona
Masticophis bilineatus DOR coll. D.L. Hardy, Sept., 1991
- May 19 0.3 mi W. Hwy 80 on Hwy 533, Hidalgo Co., New Mexico
2202 Gyalopion canum AOR 2050hr 23g
- May 20 Chiricahua Mtns., ≈ 1/2 mi E. Buena Vista Forkout, ≈ 7800' el., Cochise Co., Arizona
2203 Lampropeltis pyromelana under rock 1046hr, 19.5g w/ prey, S. virgatus
- May 21 Chiricahua Mtns., ≈ 2 mi W. Portal on Paradise Rd., Cochise Co., Arizona
2204 Hypsiglena torquata under dead agave, 0820hr.
- May 22 No locality data - captive bred at Dallas Zoo
2205 Atheris superciliosa
- May 24 Peloncillo Mtns., Guadalupe Canyon, Hidalgo Co., New Mexico
2206 Pituophis melanoleucus ♀ 561+75mm, 47.8g, released; ^{coll. T. Sinclair} Thomomys 43.6g prey
- May 25 Chiricahua Mtns., 2.3 mi W. Portal on Paradise Rd., Cochise Co., Arizona
2207 Masticophis bilineatus active 1027hr 1042+475mm, 246g

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1992

- May 25 San Bernardino Valley, Jct. Hwy 80 & Rucker Canyon Rd., Cochise Co., Arizona
2208 Sonora semiamulata under stone 1645h 110+26mm
- May 26 ~1 mi N. Hwy 533 on Hwy 80, Hidalgo Co., New Mexico
2209 Tantilla nigriceps AOR coll. B. Torberlin, May 10, 1992.
- May 27 21.7 mi E. of Newberg Springs (I-40) on Natl. Trails Hwy, San Bernardino Co., California
2210 Phyllorhynchus decurtatus AOR 2035h.
- June 21 Grasshopper Flat, Shasta-Trinity Natl. Forest, Siskiyou Co., California
2211 Bufo boreas active ~1/30h.
- July 31 Southwestern Research Station, Portal, Cochise Co., Arizona
2212 Crotalus molossus (prey only), coll. Paul Hyder, July 7, 1992, 779+41mm, 30g, prey 115g
- August 1 Chiricahua Mtns., ~2 mi W. Portal on Paradise Rd., Cochise Co., Arizona
2213 Crotalus molossus (prey only) 964+78mm, 687g; ^{requirited 2 nestlings} rats total 53g
- August 2 Chiricahua Mtns., Sunny Flat Campground, Cochise Co., Arizona
2214 Elaphe hiaspis (prey only) ^{July 31, 1992, 1702h, AOR, "28kinds" N.J. 08244} coll. Bob Maurer, 9 Wilson Ave., Sonoma Pt.,
Chiricahua Mtns., betw. E. Turkey Creek & Orion Saddle, Cochise Co., Arizona
2215 Lampropeltis pyromelana DOR ~0930h, 55.5g ^{swallowed head-first prey ♂ Sceloporus janovii (8g)}
- 2216 Sceloporus janovii removed from HWG 2215.
- August 3 Chiricahua Mtns., Cave Creek Canyon, Cochise Co., Arizona
2217 Crotalus molossus coll. B. Torberlin, July 26, 1992, ^{683+46mm 160g} pres. Aug 3, 1992
- August 5 7.2 mi E. of Hwy 285 on Hwy 90, Tenell Co., Texas
2218 Aekistodon contortrix AOR coll. B.E. Dial, July 10, 1992
- August 7 1/4 mi S. Hwy 9 on Hwy 80, Hidalgo Co., New Mexico
2219 Lampropeltis getula ^{AOR coll. S. McKessey} 100g (snake released) ^{8g} requirited S. undulatus
- 2220 Salvadora hexalepis ^{22.1 mi SW state line on Hwy 80, Cochise Co., Arizona} DOR 1956h
- August 8 ~1/2 mi E. Portal, Cochise Co., Arizona
2221 Salvadora hexalepis ^{430+110mm 27g} AOR/DOR ~1/630h ^{50: C. uniparens 6g}

Reese, H.

1992

August 8 Portal, Cochise Co., Arizona

2222 Crotalus molossus (stomach contents only) ♂ 985 + 80 mm, 905 g

2223 Crotalus molossus (fecal sample stomach contents only) ♂ 817 + 66 mm, 560 g

August 10 Antelope Pass, Peloncillo Mtns., Hidalgo Co., New Mexico

2224 Masticophis bilineatus (prey only) 786 + 362 mm, 101 g + 15 g of prey

August 12 Hwy 80 at Rucker Canyon Rd., Cochise Co., Arizona

2225 Holbrookia maculata coll. B. Torberlin, July 17, 1992 DOR

19.8 mi SW State Line on Hwy 80, Cochise Co., Arizona

2226 Sistrurus catenatus AOR 1947 hr (feces saved) 369 + 51 mm, 46 g
4 eggs complete parallel

20.4 mi SW State Line on Hwy 80, Cochise Co., Arizona

2227 Bufo alvarius AOR 2027 hr

August 13 1/2 mi SW Portal, Cochise Co., Arizona

2228 Crotalus molossus ♂ 1080 + 71 mm, 950 g
coll. B. Torberlin, August 6, 1992, feces August 13, 1992

August 15 1/2 mi E. Portal, Cochise Co., Arizona

2229 Rhinocheilus lecontei coll. M. Forden, AOR/DOR dash

August 19 Near Scotia Canyon, Huachuca Mtns., Cochise Co., Arizona

2230 Crotalus lepidus (released) ♂ 430 + 45 mm, 61 g; ^{regurgitated} Sceloporus clarki 18 g

August 20 Portal, Cochise Co., Arizona

2231 Diadophis parvifasciatus coll. June 6, 1992, B. Torberlin #1

2232 " " 5/9 hatched from eggs laid #2

2233 " " by HWG 2231 on June 20, 1992, #5

2234 " " emerged August 15-17, 1992,

2235 " " 4 others released at capture

2236 " " site of female - see separate notes.

August 21 Portal, Cochise Co., Arizona

2237 Sceloporus clarki coll. B. Torberlin (saved regurgitate)

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1992

- August 21 32.5 mi SW State Line on Hwy 80, Cochise Co., Arizona
2238 Crotalus molossus DOR x 2200hr
1.2 mi NW Southwest Research Station, Chiricahua Mtns, Cochise Co., Arizona
- 2239 Thamnophis cyrtopsis (prey only), coll. T. Mathies, \approx July 1, 1992
- September 14 \approx 8 mi. S. of I-10 on San Simon - Portal Rd., Cochise Co., Arizona
2240 Masticophis flagellum AOR/DOR 1000hr coll. D. L. Hardy, Aug. 27, 1992
2.5 mi W. Portal on Paradise Rd., Cochise Co., Arizona
2241 Crotalus molossus "#1", killed by rancher, coll. D. J. Hardy, Aug. 28, 1992
Chiricahua Mtns., John Hand Campground, Cochise Co., Arizona
2242 Crotalus molossus (snake released) 710+42mm, ♀ 280g, +150g cottontail
Antelope Pass, Hidalgo Co., New Mexico
2243 Lampropeltis getula (released) SV 305mm, 13.1g, + Sceloporus SV 64mm
in can trap, B. Timberlin, Sept 9, 1992 7.7g
- October 14 Chiricahua Mtns., Cave Creek Canyon, 2.9 mi SW Portal, Cochise Co., Arizona
2244 Elaphe triaspis DOR 2020hrs, partly consumed by skunk
Miller Ranch, 5.4 mi E. Portal, Cochise Co., Arizona
2245 Diadophis punctatus coll. \approx October 1, 1992 by Miller family
- October 25
2246 Crotalus viridis amelanistic, rec'd from Sacramento Zoo
- October 28 Near Scotia Canyon, Huachuca Mtns., Cochise Co., Arizona
2247 Diadophis punctatus coll. F. Wilson
Vicinity of Portal, Cochise Co., Arizona
2248 Diadophis punctatus rec'd from F. E. Russell, August, 1992

Greene, H.

1993

Catalogue

July 24
~~2500~~

Little Scotia Canyon, Huachuca Mtns., Cochise Co., Arizona

2500

Sonora semiannulata active 1425h, ^{220+53mm, 7.2g} SC: 2 spiders w/ egg cases

2501

Phrynosoma douglasi neonate coll. K.R. Zamudio

July 25

Little Scotia Canyon, Huachuca Mtns., Cochise Co., Arizona

2502

Sceloporus scalaris active in bunch grass, coll. K.R. Zamudio ^{54+25+21mm, 3.1g}

2503

Cnemidophorus sonorae coll. K.R. Zamudio 92+137+40mm, ^{20g}

2504

Phrynosoma douglasi neonate

July 26

Little Scotia Canyon, Huachuca Mtns., Cochise Co., Arizona

2505

Thamnophis cyrtopsis basking on rocks 0900h 690mm+? 60g

July 27

Little Scotia Canyon, Huachuca Mtns., Cochise Co., Arizona

2506

Phrynosoma douglasi neonate coll. K.R. Zamudio

2507

Holbrookia maculata gravid ♀, 56+45mm, 6g

August 1

Portal, Cochise Co., Arizona

2508

Leptotyphlops sp. $\geq 1.7g$, TL ≥ 190 mm; ^{regurgitated by} Micruroides 386+27mm, 11g

August 2

~2.5 mi W. Portal on Paradise Rd., Cochise Co., Arizona

2509

Crotalus molossus ^{♂ 1140+85mm, 1.15kg} (stomach content only - Nedona swallowed head - 1st

Jct. Hwy. 336 & 321, Jasper Co., South Carolina

2510

Lampropeltis triangulum coll. T. Sinclair, June 27, 1989

August 3

9.9 mi SW State Line on Hwy 80, Cochise Co., Arizona

2511

Thamnophis marciarius AOR/DOR ^{2020h} 467+140mm, 47g

20.7 mi SW State Line on Hwy 80, Cochise Co., Arizona

2512

Pituophis melanoleucus AOR/DOR 2040h 890+141mm, 270g

22.2 mi SW State Line on Hwy 80, Cochise Co., Arizona

2513

Sistrurus catenatus DOR 2044h, 356+38mm, 38g

19.8 mi SW State Line on Hwy 80, Cochise Co., Arizona

2514

Pituophis melanoleucus AOR/DOR 2055h, 936+135mm ^{260g}

Greene, H.
1993

August 3 7.6 mi SW State Line on Hwy 80, Cochise Co., Arizona

2515 Lampropeltis getula AOR ≈ 215 h, 452 + 79 mm, 39g

August 4 ≈ 3 mi E. Portal, Cochise Co., Arizona

2516 Micruroides euryxanthus AOR/DOR coll. B. Torberlin

~~25~~ Guadalupe Canyon, Peloncillo Mts., Hidalgo Co., New Mexico

2517 snake vertebrae, coll. B. Torberlin

High Jonesome Rocks, 4 mi. N. Antelope Wells, Hidalgo Co., New Mexico

2518 Sceloporus poinsettii coll. B. Torberlin, July 17, 1993

August 6 2.3 mi SW Portal on Care Creek Rd., Cochise Co., Arizona

2519 Crotalus molossus DOR ≈ 2100 h, coll. Aaron Frix

Greene, H.
1994

Catalogue

- May 6 Castle Rock, Conal Hollow Rd., San Joaquin Co., California
2520 Salvadora skin only, found by Brian Simon
- July 15 Spring near Westgate Pass, 8.2 mi E. of Hwy 395 on Hwy 168, Inyo Co., California
2521 Tortilla hobartsmithi coll. ^{m. J. Mahoney, m.} April 9, 1994, S.M. Deban, Garcia-París
1.7 mi SE Canelo on Hwy 83, Santa Cruz Co., Arizona, el. 5250'
- 2522 Crotalus willardi coll. F.M. Wilson, ^{August 8, 1993} AOR/DOR 1740h, 480+66 mm, 106.8 g
- July 26 Little Scotia Canyon, Huachuca Mtns., Cochise Co., Arizona
2523 Cnemidophorus sonora coll. K.R. Zamudio 0915h active
- 2524 Cnemidophorus sonora coll. K.R. Zamudio 0925h active
- July 29 Little Scotia Canyon, Huachuca Mtns., Cochise Co., Arizona
2525 Spea active after sunset, 2010h
- August 6 Portal Rd. at Hwy 80, Cochise Co., Arizona
2526 Salvadora hexalepis coll. unknown, \approx July 20, 1994
5.1 mi W. Hwy 80 on Rucker Canyon Rd., Cochise Co., Arizona
- 2527 Phrynosoma douglasi coll. R. Reiserer, July 23, 1994
2.4 mi NW Portal on Paradise Rd., Cochise Co., Arizona
- 2528 Bufo punctatus AOR 2010h, August 2, 1994
N. edge Parilla Mtns., 32.3 mi SW State Line on Hwy 80, Cochise Co., Arizona
- 2529 Hyla derma suspectum very DOR! coll. R. Goodman, August 3, 1994
7.2 mi S. Canelo on Hwy 83 at Sta. Cruz Co. Line, Cochise Co., Arizona
- 2530 Pituophis melanoleucus ^{August 5, 1994} AOR/DOR 1130h, 1265+196 mm, 680 g
2.6 mi NW Portal on Paradise Rd., Cochise Co., Arizona
- 2531 Crotalus molossus AOR/DOR 2004h, 761+59 mm, 273 g
 \approx 2 mi NW Portal on Paradise Rd., Cochise Co., Arizona
- 2531 Crotalus molossus ^{AOR 2010h, August 1, 1994} ♂ 987+73 mm, 658 g, released, scat saved

Greene, H.

1994

- August 11 1.6 mi NW Portal on Paradise Rd., Cochise Co., Arizona
- 2532 Crotalus molossus AOR 2019h, August 3, 1994, released, scat saved
Between Orion Saddle & Barfoot, Chiricahua Mtns, Cochise Co., Arizona
- 2533 Crotalus pricei ♂ 391 + 38 mm, 41.3g, coll. R. Reaser, August 9, 1994
released, saved Sceloporus jarrovi prey, head first, 19.6g
- ~1 mi NW Portal on Paradise Rd., Cochise Co., Arizona
- 2534 Crotalus atrox 1700h, August 10, 1994, released, 1028 + 58 mm, 745g ♀
saved rabbit, head-first, 225g
- Cave Creek Canyon, ~4 mi SW Portal, Cochise Co., Arizona
- 2535 Crotalus molossus DOR coll. B. Torberlin, September, 1993
Cave Creek Canyon, 3.7 mi SW Portal, Cochise Co., Arizona
- 2536 Crotalus molossus fresh DOR ~1030h coll. C. J. Cole & Kristi Hurley, 2/14/8
prey 83.5g
- August 14 Chiricahua Mtns., 1/2 mi S. Sycamore Spring, Cochise Co., Arizona
- 2537 Phrynosoma douglasi ♂ on trail in sun, 0910h
- 2538 Phrynosoma douglasi ♀ on trail in sun 0917h

Greene, H.
1995

- January 13 Chiricahua Mtns.
2539 Crotalus willardi
- July 25 Angelo Coast Range Preserve, Mendocino Co., California
2540 Pituophis melanoleucus coll. K. Meier, 1993-1994
Animal Behavior Field Station, U.C. Berkeley Campus, Alameda Co., California
- 2541 Crotalus viridis hyaena compound, Summer, 1994
100 mi W. jct. N. Sabino Canyon Rd. & Old Sabino Canyon Rd.,
Tucson, Pima Co., Arizona
- 2542 Pituophis melanoleucus coll. D.L. Hardy, Sr. Sept. 17, 1994 DOR 0730hr.
August 4 4.8 mi E. Portal, Cochise Co., Arizona
- 2543 Lampropeltis getula fresh DOR 2020hr
- August 7 3 mi E. Cloverdale, Arimas Valley, Hidalgo Co., New Mexico
- 2544 Phrynosoma douglasi B. Ton Berlin, lid 010 #6, SV 15mm, 59.9g
(saved only middle toe, right front foot, 95% ethanol)
- August 10 11.0 mi SW State Line on Hwy 80, Cochise Co., Arizona
- 2545 Heterodon nasicus DOR 1955hr
Portal, Cochise Co., Arizona
- 2546 Crotalus molossus scat saved, 965+71mm, 690g Aug 1, 1995
snake #64 released, B. Ton Berlin
- August 13 3.7 mi E. Portal, Cochise Co., Arizona
- 2547 Hypsiglena torquata DOR 2040hr
- September 2 2.9 mi NW Portal on Paradise Rd., Cochise Co., Arizona
July 23, 1995 coll. D.L. Hardy 84.5g tail state rotted
- 2548 Trimorphodon bruculatus fresh DOR 0640hr, 733+132mm
- 2549 Crotalus molossus DOR 1150hr coll. D.L. Hardy, Sr., Aug 21, 1995
- 2550 Pituophis melanoleucus

Greene, H.
1995

September 2 4.6 mi. E. Portal, Cochise Co., Arizona

2550 Pituophis catenifer AOR 1947hr, August 31, 1995

~ 2.5 mi NW Portal on Paradise Rd., Cochise Co., Arizona

2551 Pituophis catenifer AOR 0827hr, released w/ transmitter

September 5 No collection data - private collection of Jeff Gee

2552 Pituophis m. lodingi

2553 Pituophis m. melanoleucus

2554 Pituophis m. mugitus

2555 Pituophis catenifer pumilis

2556 Pituophis catenifer bimaris

2557 Pituophis catenifer vertebralis

2559 Pituophis ruthveni

} scale clips and
photos only, ETOH
95%

Animas Valley, Hidalgo Co., New Mexico

2558 Lampropeltis triangulum coll. B. Toribio, 1994 - scale clip
only

4.5 mi E. Portal, Cochise Co., Arizona

2560 Pituophis catenifer AOR/DOR 2000hr 321+54mm, 14g

September 7 ~ 1 mi S. Hwy 9 on Hwy 80, Hidalgo Co., New Mexico

2561 Crotalus scutulatus DOR coll. J. Gee, Sept. 1, 1995

~ 4 mi E. Hwy 80 on Hwy 9, Hidalgo Co., New Mexico

2562 Crotalus scutulatus DOR, coll. J. Gee, Sept. 1, 1995

September 9 Little Scottia Canyon, Huachuca Mtns, Cochise Co., Arizona

2563 Crotalus willardi scale clip 100% ETOH, snake released

September 11 Cajon Bonito, Sierra Pan de Azúcar, Sonora, Mexico

2564 Crotalus willardi scale clip only; coll. B. Martin, May 9, 1985

Cajon El Infierno, Sierra Aconchi, Sonora, Mexico

2565 Crotalus willardi scale clip only; coll. B. Martin, Aug 14, 1980

Greene, H.

1995

September 11 Patagonia Mtns., 13.3 mi S. Patagonia on Tohichi Rd., Cochise Co., Arizona

2566 Crotalus willardi

No collection data - private collection of Tom Moise

2567 Pituophis d. leppii, Michoacan, Mexico

2568 Pituophis d. leppii, Durango, Mexico

2569 Pituophis d. jani

2570 Pituophis catenifer fuliginatus, Isla San Martin, Mexico

October 22 Cucumber Creek, Oachita Mountains, DeFlore Co., Oklahoma

2571 Aythya americana 123.8g

2572 Microtus pinetorum 31.2g palped from 4WG 2571

~~2574 Uta stansburiana 80 on Hwy 9, Hidalgo Co., New Mexico~~

~~2571~~

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Greene, H.

1996

Catalog

- May 25 10.0 mi E. Borbay Rd. on Natl. Trails Hwy, San Bernardino Co., California  
2573 Crotalus cerastes 11.9g  
2574 Cnemidophorus tigris 11.3g, removed from stomach of HWG 2573
- July 14 1.5 mi N. Parker Canyon Lake, Cochise Co., Arizona  
2575 Crotalus willardi AOR, F.M. Wilson, July 8; snake released, scale clipped  
300 m W. Portal Store, Cochise Co., Arizona  
2576 Masticophis lateralis July 7, fresh DOR 0700hr, D. L. Hardy, Sr. 162g, 946+412mm
- July 16 1/4 mi N. Apache on Hwy 80, Cochise Co., Arizona  
2577 Micruroides euryzanthus DOR  $\approx$  July 7, T. A. Snell  
Chaney Cyn, just below Big Hatchet Peak, Hidalgo Co., New Mexico  
2578 Sceloporus jarrovi coll. A.T. Holycross, July 12, 1996  
 $\approx 8300'$  alt.  
1.8 mi S. Onion Saddle on Rustler Park rd., Chiricahua Mtns, Cochise Co., Arizona
- 2579 Sceloporus virgatus 7g, 63+69mm  
2580 Sceloporus virgatus 6.8g, 60+70mm  
2581 Sceloporus jarrovi 12.5g, 73+57+15mm  
2582 Sceloporus jarrovi 11.5g, 71+95mm  
2583 Sceloporus jarrovi 11.0g, 71+99mm  
2584 Sceloporus jarrovi 11.5g, 71+28+41mm
- ~~July 18~~ 8.6 mi N. of Portal Rd on Hwy 80, Hidalgo Co., New Mexico  
2585 Rhinocheilus lecontei AOR 2145hr, July 13, 1996
- July 18 32.5 mi S. Hwy I-10 on Hwy 338, Hidalgo Co., New Mexico  
2586 Hypsiglena torquata DOR coll. B. Tomberlin
- July 19 Hwy 80 at Portal Rd., Hidalgo Co., New Mexico  
2587 Pituophis catenifer fresh DOR 2050hr
- July 21 2.5 mi N. Portal Rd on Hwy 80, Hidalgo Co., New Mexico  
2588 Lampropeltis getula DOR 2240hr



Greene, H.

1996

July 23 2.3 mi SE Portal, Cochise Co., Arizona

2589 Crotalus molossus AOR/DOR 0720h, 550g, 912+73 mm

3/4 mi E. ~~NE~~ of East Turkey Creek, Chiricahua Mtns, Cochise Co., Arizona

2590 Crotalus molossus 802+63<sup>mm</sup>, coll. T. Malone, 357g

N. side of Granite Gap, Peloncillos Mtns., Hidalgo Co., New Mexico

2591 Crotalus molossus AOR/DOR 2000h, 980g, 1170+86 mm

July 28 ~2.5 mi W. Portal on Paradise Rd., Cochise Co., Arizona

2592 Pituophis catenifer scale clip saved, snake released. 1200+65 mm <sup>675g</sup>

~25 mi SW State Line on Hwy 80, Cochise Co., Arizona

2593 Heterodon nasicus AOR, coll. T. Snell, July 22, 1996

August 4 Vicinity Southwestern Research Station, Chiricahua Mtns., Cochise Co., Arizona  
(#87)

2594 Crotalus molossus scat only, snake released. ♀ 490+29 mm, 66.1g

2595 Crotalus molossus stomach contents saved, snake released. ♀ 401+23 mm, 46.6g

August 5 0.6 mi N of Hwy 533 on Hwy 80, Hidalgo Co., New Mexico

2596 Rhinocheilus lecontei 2310 h AOR, coll. S. P. Mackenzy

August 8 ~4-5 mi SE Portal, Cochise Co., Arizona

2597 Arizona elegans DOR ~2000h, coll. B. Torberlin 335+52 mm <sup>11g</sup>

August 9 Big Springs Trail, 5400-5600' el., Madra Canyon, Santa Rita Mtns, <sup>Santa Cruz Co.,</sup> Arizona

2598 Sceloporus janovii 76+44 mm. + 34; 13.5 gms. coll. E.L. Greene

2599 Sceloporus janovii 77+105 mm.; 14.8 gms coll. K.R. Zamudio

2600 Tantilla wilcoxi 5.5 gms pres. September 12, 1996 <sup>243+82 mm</sup>

August 10 Miller Peak Trail, Sunnyside Canyon, Huachuca Mtns, Cochise Co., Arizona

2601 Sceloporus janovii coll. E.L. Greene 81.0+22+46; 14.8 gms.

2602 Sceloporus janovii coll. K.R. Zamudio 79+62+29; 15.8 gms.





Greene, H.

1996

- August 11 Gardner Canyon Trail, Santa Rita Mtns., Santa Cruz Co., Arizona
- 2603 Sceloporus janovii 6100' el. coll. E.L. Greene 71+81+?; 15.0 gms
- 2604 Sceloporus janovii 6100' el. coll. K.R. Zamudio 86+121; 20 gms
- 2 mi. W. Harshaw Rd. on Guajolote Rd., Patagonia Mtns, Santa Cruz Co., Arizona
- 2605 Sceloporus janovii 5900' el. coll. K.R. Zamudio 67+45+28; 10.0 gms
- August 12 ≈ 2 mi SW State Line on Hwy 80, Cochise Co., Arizona
- 2606 Rhinocheilus lecontei AOR, B. Tomberlin 351+56mm, 18g  
69+151mm 7.7g
- 2607 Enemidophorus uniparens regurgitated by HWG 2606
- August 14 1.7 mi N. of Hwy 533 on Hwy 80, Hidalgo Co., New Mexico
- 2608 Lampropeltis getula AOR/DOR 2105h, 836+137; 184 gms
- ~~26~~ 4.8 mi W of Hwy 80 on Hwy 9, Hidalgo Co., New Mexico
- 2609 Crotalus atrox DOR 2125h, 615+46mm.; 153 gms.
- 2.1 mi E. of Portal, Cochise Co., Arizona snake released
- 2610 Crotalus atrox AOR 2216h, 810+51mm, 31g, regurg. Dipodomys 36.5g  
0.5 mi. E. of Portal, Cochise Co., Arizona
- 2611 Rhinocheilus lecontei AOR ≈ 2115h, coll. D.L. Hardy Sr., 80 g
- August 16 ≈ 2.5 mi W. Portal on Paradise Rd. Cochise Co., Arizona
- 2612 Masticophis lateralis DOR 0900h
- ≈ 3-4 mi. E. Hwy 80 on Hwy 9, Hidalgo Co., New Mexico
- 2613 Rhinocheilus lecontei DOR coll. K.R. Zamudio
- 32.5 mi E. Hwy 80 on Hwy 9, Hidalgo Co., New Mexico
- 2614 Crotalus viridis DOR coll. K.R. Zamudio
- August 20 Portal, Cochise Co., Arizona
- 2615 Crotalus molossus (released) regurgitated Peromyscus 26.2g coll.  
308+12mm, button, 20.3g ♀ D.L. Hardy Sr



Greene, H.

1996

- August 25 Grasshopper Flat, Shasta-Trinity Natl. Forest, Siskiyou Co., California
- 2616 Phrynosoma douglasi ♂
- 2617 Phrynosoma douglasi ♀
- August 30 4.5 mi SW Portal on Cave Creek Rd (USFS 42), Cochise Co., Arizona
- 2618 Crotalus molossus 594 + 35 mm, 136 g, coll. D.L. Hardy Sr
- 2619 Eutamias dorsalis 38 g, requigulated by HW 6 2618 <sup>Santa Cruz</sup>
- October 5 6 mi. up Gardner Canyon, Santa Rita Mtns., Cochise Co., Arizona
- 2620 Crotalus molossus DOR coll. R. Staub, August 11, 1996
- South Fork, Cave Creek Canyon, Chiricahua Mtns, Cochise Co., Arizona
- 2621 Lampropeltis pyromelana coll. R. Staub, August, 1989.
- Above Herb Martyn Dam, Chiricahua Mtns., Cochise Co., Arizona
- 2622 Lampropeltis pyromelana coll. R. Staub, June, 1996.
- SW base Mt. Eldon, ~ 2 mi NW of Hwy 89, Flagstaff, Coconino Co., Arizona
- 2623 Phrynosoma douglasi coll. B. W. Schubert, October 1, 1996
- October 16 Huachuca Mtns. Cochise Co., Arizona
- 2624 Crotalus willardi coll. F. M. Wilson, DOR 426 + 49 mm <sup>66.3g</sup>
- November 12 2.8 mi W. Portal on Paradise Rd., Cochise Co., Arizona
- 2625 Crotalus molossus coll. D.L. Hardy Sr. DOR/40R 1050 hrs, 74°F <sup>362 + 21 mm,</sup> 31.4g



Greene, H.

1997

- July 30 0.2 mi E. Hwy 80 on Hwy 9, Hidalgo Co., New Mexico  
2626 Bufo cognatus AOR 2004 hr, 4140' el. (lives)
- 1.4 mi E. Hwy 80 on Hwy 9, Hidalgo Co., New Mexico  
2627 Bufo cognatus AOR 2010 hr, 4080' el. (lives)
- 3.6 mi E. Hwy 80 on Hwy 9, Hidalgo Co., New Mexico  
2628 Rhinocheilus lecontei trapped in cattle guard 2055 hr <sup>4180' el.</sup>
- 2.8 mi E. Hwy 80 on Hwy 9, Hidalgo Co., New Mexico  
2629 Bufo cognatus 2057 hr AOR 4140' el. (lives)
- 1.0 mi E. Hwy 80 on Hwy 9, Hidalgo Co., New Mexico  
2630 Bufo cognatus AOR 2105 hr, 4080' el. (lives)
- July 31 3.6 mi E. Hwy 80 on Hwy 9, Hidalgo Co., New Mexico  
2631 Hypsigena torquata trapped in cattle guard, 4180' el.  
≈ 3 mi W. Portal on Paradise Rd., Cochise Co., Arizona
- 2632 Crotalus molossus DOR ≈ 0945 hr, coll. C. Ran, May 7, 1997  
18.0 mi SW State Line on Hwy 80, Cochise Co., Arizona
- 2633 Pituophis catenifer DOR 2115 hr, 4640' el. (lives)  
17.6 mi SW State Line on Hwy 80, Cochise Co., Arizona
- 2634 Sistrurus catenatus DOR 2117 hr, 4640' el. (lives)  
17.0 mi SW State Line on Hwy 80, Cochise Co., Arizona
- 2635 Crotalus atrox DOR 2120 hr (lives)
- August 2 Wood Canyon Trail, Chiricahua Mtns, Cochise Co., Arizona <sup>5660-5940' el.</sup>  
2636 Sceloporus virgatus coll. K. R. Zamudio (lives)
- 2637 Sceloporus virgatus coll. K. R. Zamudio (lives)
- 2638 Sceloporus virgatus coll. K. R. Zamudio (lives)
- 2639 Sceloporus virgatus coll. K. R. Zamudio (lives)
- 2640 Sceloporus virgatus coll. K. R. Zamudio (lives)





Greene, H.

1997

- August 2 Wood Canyon Trail, Chiricahua Mtns., Cochise Co., Arizona 5660-5900' el.
- 2641 Sceloporus virgatus coll. K.R. Zamudio (live)
- 2642 Sceloporus virgatus coll. K.R. Zamudio (live)
- 2643 Sceloporus virgatus coll. K.R. Zamudio (live)
- August 3 Rucker Canyon Rd. 0.8 mi NE of USFS Boundary, Chiricahua Mtns, Cochise Co., Arizona
- 2644 Masticophis bilineatus DOR 14/6 hr, eaten by vultures
- Rucker Canyon Rd., 0.8 mi NE Camp Rucker, Chiricahua Mtns, Cochise Co., Arizona
- 2645 Sceloporus virgatus (live)  $\approx 6500'$  el. Arizona
- August 12 Pinaleno Mtns, 3.5 mi S. Sawmill Tank on Tripp Canyon Rd., Graham Co., Arizona
- 2646 Masticophis taeniatus AOR 1135 hr, 1052 + 410 mm 195g (live)
- August 14 3.6 mi E. Hwy 80 on Hwy 9, Hidalgo Co., New Mexico
- 2647 Thamnophis cyrtopsis trapped in cattle guard 2145 hr. 193 + 53 mm 3.0g
- S. 1 mi E. Portal, Cochise Co., Arizona
- 2648 Rhinocheilus lecontei AOR 2225 hr, 4360' el., 95g



Greene, H.  
1998

June 16, 1998

2649 Masticophis flagellum, long-term captive

2650 Lampropeltis mexicana greeri, long-term captive

2651 Pituophis m. lodingi ♂

2652 Pituophis m. lodingi ♀

June 18, 1998 Received from Kentucky Reptile Zoo

2653 Akhistrodon bilineatus taylori ♂

2654 Akhistrodon bilineatus taylori ♀

July 29 17.6 mi SW State Line on Hwy 80, Cochise Co., Arizona

2655 Crotalus scutulatus AOR 2010hr 495 + 30 mm, 75g

21.6 mi SW State Line on Hwy 80, Cochise Co., Arizona

2656 Crotalus scutulatus AOR 2047hr 505 + 32 mm, 79g

5.8 mi E. Portal, Cochise Co., Arizona

2657 Crotalus scutulatus AOR 2140hr 520 + 37 mm, 80g

July 31 Rucker Cyn Rd. at Hwy 80, Cochise Co., Arizona

2658 Anelytana signinum AOR 2045hr

2659 Anelytana signinum AOR 2050hr

2660 Thamnophis marciatus AOR 2025hr 351 + 107 mm 19g

August 1 Silver Creek, ~2.5 mi W. Portal, Cochise Co., Arizona

2661 Micruroides euryzanthus active 0930hr, 12g

August 2 0.3 mi E. Portal, Cochise Co., Arizona

2662 Rhinocheilus lecontei 2045hr 655 + 106 mm 120g

2.7 mi SW State Line on Hwy 80, Cochise Co., Arizona

2663 Pituophis melanoleucus DOR after dark, coll. D. L. Hardy



Greene, H.

1998

- August 3  $\approx$  2.5 mi W. Portal, Cochise Co., Arizona
- 2664 Crotaphytus collaris 112+211mm, 64g <sup>coll.</sup> M. Martins  
1.8 mi SW State Line on Hwy 80, Cochise Co., Arizona
- 2665 Bufo elegans DOR, coll. D.L. Hardy, July 27, 1998  
2.9 mi SW State Line on Hwy 80, Cochise Co., Arizona
- 2666 Crotalus atrox DOR coll. D.L. Hardy, July 27, 1998
- August 4 15.8 mi SW State Line on Hwy 80, Cochise Co., Arizona
- 2667 Crotalus scutulatus AOR 1955hr 649+35mm, 180g  
8.5 mi SW State Line on Hwy 80, Cochise Co., Arizona
- 2668 Crotalus atrox AOR/DOR 2010hr
- 2669 Crotalus atrox AOR/DOR 2010hr  
Southwestern Research Station, Care Creek Canyon, Chinichua Mtns.  
Cochise Co., Arizona
- 2670 Crotalus molossus DOR, coll. W. C. Sherbrooke  
3.4 mi E. of Sycamore Canyon on Hwy 39 (Riley Rd.)  
Santa Cruz Co., Arizona
- 2671 Onychelais aeneus <sup>kept in cooler 4 days, fissured. Aug 1, 1998</sup> DOR 1201hr, coll. R. H. Goodman Jr.
- August 7  $\approx$  9 mi NE Douglas on Hwy 80, Cochise Co., Arizona
- 2672 Crotalus atrox AOR 1957hr 814+73mm, 408g  
20.9 mi SW State Line on Hwy 80, Cochise Co., Arizona
- 2673 Sistrurus catenatus DOR 2030hr  
20.4 mi SW State Line on Hwy 80, Cochise Co., Arizona
- 2674 Crotalus scutulatus DOR 2055hr
- August 8 1.9 mi E. Portal, Cochise Co., Arizona
- 2675 Micruroides euryxanthus AOR 2000hr, 9.5g





Greene, H.

1998

August 10 2.2 mi E. Portal, Cochise Co., Arizona

2676 Lampropeltis getula AOR after dark, coll. D.L. Hardy Sr

1.5 mi E. Portal, Cochise Co., Arizona

2677 Hypsibema torquata AOR after dark, coll. M. Martins

August 11 Hwy 286 between Thurber's & Sasabe, Pima Co., Arizona

2678 Rhinocheilus lecontei AOR after dark, coll. P. Torberlin



Greene, H.  
1997

May 29 Tam Dao, Vinh Yen Dist., Vinh Phuc Prov.,  
Viet Nam

- 3000 Trimeresurus stejnegeri 2145h ♂ 594+149<sup>mm</sup> 70.5g
- May 30 Tam Dao, Vinh Yen Dist., Vinh Phuc Prov., Viet Nam
- 3001 Sironatrix trianguligera 1700h, 271+100mm 17.0g
- 3002 Liopeltis multicinctus, 693+278mm 94.5g
- 3003 Liopeltis multicinctus, 677+306mm, 77.5g
- 3004 Amphiesma modesta 367+205mm, 19.5g
- 3005 Amphiesma modesta 265+105mm, 10.0g
- 3006 Amphiesma modesta 355+170mm, 20.5g
- 3007 Trimeresurus microsquamatus ♂ 791+191, 84.5g
- 3008 Bungarus fasciatus 1055+101mm 287g
- 3009 Bungarus fasciatus 1291 +118mm, 450g
- 3010 Bungarus fasciatus 1260 +130mm, 570g
- 3011 Trimeresurus stejnegeri 646+145mm, 89g
- 3012 Trimeresurus albolabris 518+84mm, 54g
- 3013 Trimeresurus albolabris 430+68mm, 30g
- 3014 Trimeresurus albolabris 449+77mm, 36.5g
- 3015 Trimeresurus albolabris 481+124mm, 40g
- 3016 Acanthosaura lepidogaster ♀ 100+194mm, 29.5g
- 3017 Acanthosaura lepidogaster ♂ 99+178mm, 29.5g
- 3018 Acanthosaura lepidogaster ♂ 80+142mm, 13g
- 3019 Acanthosaura lepidogaster ♀ 108+161mm, 27g
- 3020 Acanthosaura lepidogaster ♀ 99+158mm, 24g
- 3021 Acanthosaura lepidogaster ♂ 86+149mm, 21.5g
- 3022 Acanthosaura lepidogaster ♂ 86+176mm, 19g
- 3023 Acanthosaura lepidogaster ♂ 85+159mm, 16.5g



Greene, H.  
1997

May 31 Tam Dao, Vinh Yen Distr., Vinh Phuc Prov.,  
Viet Nam

- 3024 Colamaria pavimentata 193+20 mm, 1.9g
- 3025 Xenopeltis unicolor reyn. not h<sup>f</sup> HLM
- 3026 Trimeresurus albolabris ♀ 610+108 mm, 65.5g
- 3027 Trimeresurus microsquamatus ♀ 680+139 mm, 68g
- 3028 Trimeresurus stejnegeri ♂ 580+152 mm, 61.5g
- 3029 Trimeresurus albolabris ♀ 410+114 mm, 25.5g
- 3030 Trimeresurus stejnegeri ♂ 525+146 mm, 43g
- 3031 Trimeresurus albolabris ♀ 523+89 mm, 64g
- 3032 Trimeresurus stejnegeri ♂ 464+120 mm, 35g
- 3033 Trimeresurus stejnegeri ♀ 419+98 mm, 32.5g
- 3034 Trimeresurus stejnegeri ♂ 540+139 mm, 42.0g
- 3035 Trimeresurus stejnegeri ♂ 536+132 mm, 44g
- 3036 Trimeresurus albolabris ♀ 391+65 mm, 27.5g
- 3037 Trimeresurus albolabris ♂ 361+82 mm, 17.5g
- 3038 Trimeresurus stejnegeri iris green, 203+41 mm, 2.9g
- 3039 Paramesotriton deloustali HLM 106+95 mm, 41.5g
- 3040 Sinonatrix trianguligera 900+301 mm, 570g

June 2 Tam Dao, Vinh Yen Distr., Vinh Phuc Prov., Viet Nam

- 3041 Rhabdophis chrysargus L 780+191 mm, 175g
- 3042 Naja atra coll. N. Orlor L 686+121 mm, 118g
- 3043 Enhydryas plumbea 326+41 mm, 45g
- 3044 Xenochrophis flavipunctatus HLM 384+129 mm, 31g
- 3045 Lycodon subcinctus HLM 720+146 mm, 41.5g
- 3046 Lycodon rostrati HLM 608+166 mm, 53g



Reene, H.

1997

- June 2 Tam Đảo, Vĩnh Yên Dist., Vĩnh Phúc Prov., Viet Nam
- 3047 Opisthotropis jacobus coll. N. Orlov 365+109 mm, 19g
- June 3 Tam Đảo, Vĩnh Yên Dist., Vĩnh Phúc Prov., Vietnam
- 3048 Sinonatrix trianguligera 1955h, 895m, 296+102 mm, 21g
- 3049 Microhyla heymonsi
- 3050 Dromops richetti 870m, 2110h, +leech
- 3051 Leptolalax pelodytoides
- 3052 Philautus cf. gyllis
- 3053 Philautus cf. gyllis
- 3054 Gekko sinensis 64+64 mm, 2215h, 955m, 5g
- 3055 Bufo melanostictus
- 3056 Bufo melanostictus
- 3057 Rhacophorus verrucosus
- 3058 Rhabdophis chrysargus 508+143 mm, 60g
- 3059 Rhabdophis chrysargus 870+181 mm, 185g
- 3060 Sinonatrix trianguligera 436+61+? mm, 52g
- 3061 Cyclophiops major 872+251 mm, 190g
- 3062 Trimeresurus microsquamatus 687+152 mm, 64g
- 3063 Trimeresurus microsquamatus 493+110 mm, 24.5g
- 3064 Trimeresurus stejnegeri <sup>orange iris</sup> 360+89 mm, 18g
- 3065 Paras hamptoni 265+85 mm, 4.65g
- 3066 Lycodon x2100h, 960m, 502+130 mm, 53g
- 3067 Dinodon 2115h, 950m, 716+196 mm, 61.5g
- 3068 Sinonatrix trianguligera 2145h, 646+274 mm, 215g
- 3069 Dinodon 1017 + 174 + ? mm, 140g
- 3070 Dinodon 832 + 77 + ? mm, 74g
- 3071 Lycodon 461+129 mm, 14g





Greene, H.

1997

June 3

Tam Đảo, Vĩnh Yên Dist., Vĩnh Phúc Prov., Vietnam

3072

Pareas hamptoni 338+100 mm, 10g

June 4

Tam Đảo, Vĩnh Yên Dist., Vĩnh Phúc Prov., Vietnam

3073

Trimeresurus microscquamatus 889+127 mm, 115g

3074

Calliophis macclellandi 415+56 mm, 11.5g

3075

Rhabdophis chrysargus 840+176 mm, 178g

3076

Rhabdophis chrysargus 800+171 mm, 140g

3077

Cyclophiops major 816+265 mm, 140g

3078

Cyclophiops major 764+241 mm, 95.5g

3079

Amphiesma modesta 373+200, 22g

Snake market in Vĩnh Yên, Vĩnh Phúc Prov., Viet Nam

3080

Enhydrys bennettii 721+109 mm, 453g

June 5

Vicinity of Tam Đảo, Vĩnh Yên Dist., Vĩnh Phúc Prov., Viet Nam

3081

Gekko sinensis 71+56 mm, 6g

3082

Phipsignathus coccineus 215+435 mm, 340g

3083

Elaphe radiata 960+250 mm, 220g

3084

Calliophis macclellandi ~~355~~ 383+87, 8.5g

3085

Leptolalax pelodytoides ~2300h, hotel

3086

Trimeresurus microscquamatus 1792+190 mm, 104g  
2005h, 905m,

June 6

Vicinity of Tam Đảo, Vĩnh Yên Dist., Vĩnh Phúc Prov., Viet Nam

3087

Trimeresurus microscquamatus 489+126 mm, 30g

3088

Trimeresurus microscquamatus 587+126 mm, 54g  
AOP/DOR 2015h, 905m

$$\begin{array}{r} 49.0 \\ 12.5 \\ \hline 36.5 \end{array}$$

Greene, H.  
1997

June 7 Vicinity of Tam Đảo, Vĩnh Yên Dist.,  
Vĩnh Phúc Prov., Viet Nam

3089 Xenocrophus flavipunctatus 545+202mm, 111g

June 8 Vicinity of Tam Đảo, Vĩnh Yên Dist.,  
Vĩnh Phúc Prov., Viet Nam

3090 Mabuya longicaudata 91+225mm, 18g

3091 Trimeresurus mucrosquamatus 571+111mm, 40g

3092 Trimeresurus mucrosquamatus 741+172mm, 82.5g

3093 Bungarus multicinctus 854+127mm, 181g

3094 Pareas hamptoni 333+99mm, 12g

3095 Sinonatrix triangularis 1920hr, 960m, 505+221mm, 72.5g

3096 Amolops nickeltii 1920hr, 960m, 2leeches 39mm, 4.5g

3097 Amolops nickeltii 1920hr, 960m, 2leeches 6.5(-1leech), 41mm

June 9 3098 Dinodon rufozonatum ♀ (snake kept by N. Orlor, frog prey retained) 922+213mm, 249g, ROM Field 2109

3099 Lycodon ruber ♂ (snake kept by N. Orlor, tissue). 501+129mm, 32g, ROM 2109

3100 Pareas margaritophorus 458+86mm, 33g

June 11 Vicinity of Tam Đảo, Vĩnh Yên Dist.,  
Vĩnh Phúc Prov., Vietnam

3101 Sibynophis chinensis 1040hr, DOR, 270+106mm, 11g

3102 Trimeresurus stejnegeri 2045hr, 1000m, 36.5g, 442+111mm

3103 Trimeresurus mucrosquamatus AOR 2150hr, 905m, 34g

June 12 3104 Trimeresurus monticola ♂ coll. T.J. Papenfuss, 795m, 70g

June 13 3105 Sinonatrix triangularis 201g, 2000hr, 745m, 652+266mm

June 13 Vicinity of Tam Đảo, Vĩnh Yên Dist.,  
Vĩnh Phúc Prov., Viet Nam

3106 Sinonatrix triangularis regurg. 2. Cnemidophorus rump-tail, 27+g

3107 Megophrys lateralis ♀ 95mm, 50.5g



Greene, H.  
1997

June 13 Vicinity of Tam Đảo, Vĩnh Yên Distr.,  
Vĩnh Phúc Prov., Việt Nam

3108 Trimeresurus stejnegeri 1920h, 945m, 455+105mm, 31g

June 14 Vicinity of Tam Đảo, Vĩnh Yên Distr.,  
Vĩnh Phúc Prov., Việt Nam

3109 Trimeresurus stejnegeri 550+141, 68.5g

June 15 Tam Đảo, Vĩnh Yên Distr., Vĩnh Phúc Prov.,  
Việt Nam

3110 Sinonatrix triangularis

3111 "Pseudoboiga" AOR 2035h, 905m, 938+328mm, 103g

June 16 Vicinity of Tam Đảo, Vĩnh Yên Distr.,  
Vĩnh Phúc Prov., Việt Nam

3112 Rhabdophis chrysargus 180g

3113 Megophrys lateralis requisited by HWG 3112, 45g

3114 Sinonatrix triangularis

3115 Polypterus leucomystax requir. by HWG 3114

June 17 Vicinity of Tam Đảo, Vĩnh Yên Distr.,  
Vĩnh Phúc Prov., Vietnam

3116 Opisthotropis jacobii 425 + 71mm, 45g

3117 Deaco maculatus 65+112mm 2.9g

3118 Tropidophorus hainanensis 48+29+10mm, 2.1g

3119 Trimeresurus stejnegeri ♂ 536<sup>ethanol</sup>+151mm, 55g

3120 Trimeresurus monticola ♀

3121 Trimeresurus monticola ♀





June 18 Newt pond, Tam Đảo, Vĩnh Yên District, Vĩnh  
Phúc Province, Vietnam.

- 3122 Sinonatrix trianguligera 494+199 mm; 90.5 gms.  
3123 Sinonatrix trianguligera 323+116 mm; 28.0 gms.  
3124 Sinonatrix trianguligera 360+135 mm; 39.0 gms.  
3125 Sinonatrix trianguligera 283+113 ; 19.0 gms.  
3126 Sinonatrix trianguligera 308+105 ; 30.5 gms.  
3127 Sinonatrix trianguligera 336+123 ; 26.0 gms.  
3128 Sinonatrix trianguligera 416+160 ; 49.0 gms.  
3129 Sinonatrix trianguligera 296+104 ; 20.0 gms.  
3130 Sinonatrix trianguligera 551+211 ; 149.0 gms.

3

# H. Greene

1991-1998

## Journal

1991

Arizona: Pima, Cochise Cos.

Calif: Contra Costa, Siskiyou Cos.

Costa Rica: Santa Rosa Nat. Park, La Selva B. S.

Arizona: Cochise Co.

New Mexico: Hidalgo Co.

hwg2@cornell.edu

Greene, H.  
1991

# Journal

- March 25 Tucson, Pima Co., Arizona  
arrived here yesterday afternoon, left Berkeley morning before. Spent this morning examining Sistrurus catenatus in the University of Arizona collection, courtesy of Charles H. Jare and George Bradley. George, the technician, grew up around Prescott and told me he had seen a denning aggregation of Crotalus molossus near there. Also said he's seen woodrats in the stomachs of DOR blacktails, and once an Ammospermophilus leucurus. Spoke briefly w/ Cecil Schwalbe, who told me that April 10, 1986, he found a "coubly" pair of blacktails — he will get details. Dinner w/ Katrina Mangin.
- March 26 Portal, Cochise Co., Arizona  
arrived here  $\approx 1700$ h just ahead of a cold front. Snow down to  $\approx 6-7000'$  el. in the Chiricahuas proper, but none on Finestone Mountain (our Crotalus molossus site) or other nearby outliers.
- March 27 From  $\approx 1030-1230$  h I worked over the slopes of Finestone Mountain, our Crotalus molossus study site. Low vegetation is bare and sparse, but if anything the catclaw spines are sharper than I've ever seen them. At  $\approx 1130$ h, bright sun & clear sky, I traced the signal of ♂ #7 (148.239) to a hole w/in a cave of a limestone outcrop, where Barney tells me the snake has been for some time. It is at the top of a fissure from which runs a river of Neotoma droppings. I stuck my head up in the hole and heard a growing humming noise, then looked up to see bees flying!



Greene, H.  
1991

March 27  
(continued)

I could not pick up signals (all Telonics receivers) for ♂♂ # 3, 6, or 7 - don't know why. Next Barney Tomberlin and I drove to Krenz Ranch and turned rocks along Rucker Canyon Rd., 1-2 mi W of Hwy 80 - I caught 2 sceloporus undulatus under rocks but obviously warmed up and active. Picked up a few snakes Barney preserved for me last Fall. On the way back from Krenz Ranch at 1415 hr we found a large adult Crotalus scutulatus crossing State Line Rd. - when we approached it flattened the entire body, drew the head back into a tight S-will such that the tail was toward us and the body stretched away almost straight w/ the head turned back and slightly elevated to face us. Barney kept the snake. What a mercurial landscape these southwestern deserts! a few nights ago I was driving through the eastern Mojave Desert after recent days of rain. The smell of wet creosote bush seeped into my truck - rich, sharp, clean, invigorating, almost intoxicating - evoking unexpected images of green leaves and yellow flowers while ahead only a steady stream of oncoming car lights stretched on into the eastern edge of night. The next day, hurtling down the dips and curves of Hwy 95, south from Needles, I realized that all those purple brown mountain ranges seem to float out of the surrounding basins - they float!





Greene, H.

1991

March 27  
(continued)

Today in the Chiricahuas at dusk - Limestone Mtn. a huge, rocky sleeping hulk off to the north, no snow on it. The central peaks, more wooded and w/ snow down to  $\approx 7000'$  el., somehow all seemed Oriental. And somehow in the cold gathering dark Limestone Mtn. seemed alive - how many bunnies and blacktails, bears and lions, live up there? Would the mountain die w/out them? Around midnight a ferocious dark storm howls in, and when I stepped out on the porch to pee I could smell wet dust in the wind.

March 28

This morning there is snow down to about 4000' el.! Cold, patches of clear sky, large clouds. Drove to Tucson for lunch w/ Howard Fowler. Dinner w/ Wayne Maddison, Rob Robidoux, and their families. Start the two day trip back to Berkeley tomorrow.

April 5-7

White Mtn. Research Station, Inyo Co., California  
attended a meeting of UC ecologists here w/ Wendy Roberts, and on the way stopped to ride bikes on a dirt road north of Mono Lake. Manager told me about a Pituophis melanoleucus that got stuck in chicken wire and died.



Greene, H.

1991

April 19

Briones Regional Park, Contra Costa Co., California

Today I saw a mountain lion! Wendy Roberts and I rode our mountain bikes from the Bear Creek Rd. entrance parking lot east up Old Briones Rd. Trail. At  $\approx 1230$  hr,  $\approx 1200'$  el.,  $\approx 2/3$  up the long, winding slope to Briones Crest I tired and sat beside the dirt road while Wendy rode to the top. She returned shortly and we sat in the grass, eating sandwiches and talking. At  $\approx 1240$  hr I suddenly saw part of a red-tan animal disappear in shrub vegetation on the hillside SW of us and across a ravine, perhaps 100 m away. I remarked it looked like a carnivore, but for a couple of minutes we couldn't get a good view and speculated unconvincingly about a badger or raccoon. Then as the animal moved out into view and leisurely traveled in irregular direction over the slope, we saw its feline form and black-tipped tail. The cat moved to the horizon, slope of the hill, looked at us, disappeared, reappeared and again looked at us, then walked up the hill on the horizon and disappeared behind trees. We saw it for  $\approx 5$  minutes and identification as Felis concolor was certain. We thought the cat seemed to be searching in vegetation - the hill is fairly open, covered in green grass, with scattered shrubs and small trees. The cat definitely looked at us but never seemed alarmed. Knowing of several recent fatal attacks on humans in the U.S., we were



Greene, H.  
1991

April 19  
(continued)

neither afraid nor completely at ease about its nearby presence - we joked about not making rabbit noises while riding down the hill. Back at MVZ I checked to find Carl Koford's published observation of a lion in California stalking a deer had been at 1240 hr! We were still buzzing and incredulous about seeing the lion ~~by~~ mid-afternoon, and tonight I read pieces about mountain lions by Charles Bowden and Edward Abbey.

May 3

Brewer's Regional Park, Contra Costa Co., California

Spent the morning here w/ my natural history class and found only inactive Sceloporus, Eumeces skiltonianus, and Coluber constrictor under rocks - a chilly, windy, overcast morning. The Coluber was a yearling ♂, 290+95mm w/ obvious umbilical scar, regurgitated the femur of a black field cricket.

May 4

Same locality, same Coluber under the same rock, but today no palpable stomach contents or feces. In late morning we encountered an adult Pituophis as it emerged from a tunnel that surfaced under a rock.

June 10-12

Grasshopper Flat, 24 mi N. Battle (Hwy 89) on Harris Springs Rd., Siskiyou Co., California

W/ Sally Zamudio saw 13 Phrynosoma douglasii - caught, marked, and released 9 for her studies; these included yearlings, second year juveniles, adult females w/ possibly palpable embryos, and a male w/ swollen hemipenes. Sally kept measurements, sexes, and capture times. Four





Greene, H.

June 21

Santa Rosa National Park, Guanacaste Prov., Costa Rica  
Arrived here in rental car  $\approx 1000$  hr w/ Wendy Roberts, having arrived in Costa Rica on the 19th and spent last night at the Hotel Boyeros in Liberia. We walked around a nature trail and a side branch twice by 1130hr, in an area centered on Quebrada Duende, near the memorial hacienda "La Casona" - same area Beth Baker and I visited during the dry season  $\approx 1981$ . Now it is lush, green, and humid. Dr.  $\approx 3$  km of walking we saw a Buteo magnirostris (perched on limb  $\approx 3-4$  m high at trailside), an anole (on green leaf near ground), and several juvenile and adult Ctenosaura similis. Everywhere there are brown and red leaves on the ground, even now in the wet season, so it is easy to see how Aythya bilineatus would be very cryptic on this background. On the road driving back to Liberia we saw a beautiful hawk, Parabuteo unicinctus, perched on a phone pole. Driving toward the coast after a late lunch at El Bramadero, we watched a big thunderstorm to the northwest and met it full force as we pulled into Cabinas Playa Hermosa. Wendy went in to see about lodging and found various guests and workers seated on the restaurant patio in  $\approx 20-30$  cm of water! We took a room, then went to nearby Playa del Coccos for a pizza dinner. On the road returning we saw Gastrophysa, Bufo



Greene, H.  
1991

June 21  
(continued) marinus and B. cf. leutkeni, and a leaping Hyla or Rana, a light rain still falling. Walking along the beach at Playa Hermosa we heard a ~~loud~~ frog chorus, localized it to a large pond beside a house and just inland from the beach edge, and thought we heard B. marinus, cf. Smilisca, and one other species.

June 22 Playa Hermosa, Guanacaste Prov., Costa Rica  
at breakfast we arranged for a boat in order to search for Pelamis platurus in Bahía de Culebra: the waiter referred us to Mike the cook, a former pescadero who took us to two brothers who lived w/ their mother, six other brothers, and six sisters in the house next to the "frog pool", perhaps 200 m North of Cobinas Playa Hermosa. From 1100-1230 hr we traveled w/ Freddy and Albán around Islas Pelonas in the same general area I saw w/ Alejandro Solórzano, except this time we saw not one really good stick w/ a line of debris in it, nor Pelamis. The morning was partly cloudy and hot - again I marveled that the Pelamis float and endure that U.V. load. The brothers say sea snakes are most commonly seen in October, and then even wash up on the beach and are a hazard to children; that last year a Canadian was paying \$3000/snake ( $\approx$  \$30). Water was blue and fairly calm today. Paid them \$2200 for 1 1/2 hours, much cheaper than w/ Alejandro at Playa del



Greene, H.  
1991

June 22  
(continued)

Cozo, although Albani says that place is more poor than here. "Body surfing" w/ Wendy after lunch.  $\approx 1615$ h it's getting darker and there's thunder in the distance. Lots of butterflies around here - yesterday we saw clouds of several species, "puddling" near the beach, at at least 6 times in the Bay, several km from land a single one (usually bright yellow or orange) would fly by the boat a meter or two above the water. Twice I saw 2 butterflies, evidently the same species and flying together. Wendy says they might be migrating, or victims of the wind. On the grounds of the Cabinas is a cage w/ two bright white/gray squirrels w/ dark middorsal stripes, identifiable in Emmons' book as Sciurus variegatus (later we saw a similar colored animal run off the road nearby, so presume these are local). At  $\approx 1700$ h we walked to the pond behind Albani's house from whence came the frog chorus last night. Next door is a bar, and between it and the pond are four piroes w/ "\$30" or "\$20" painted on each door (they looked identical and we didn't enter to investigate the price difference). There is trash everywhere in and around the brown pond - a squalor ranging from discarded wooden chairs to beer bottle shards - and scuttling everywhere and in all sizes are the bright purple, yellow, and red



Greene, H.

1991

June 22  
(continued)

crabs so commonly seen at Manuel Antonio National Park. As we approached the pond I saw a crab disappear into the pond beside an inundated tree, taking w/ it what looked in a fast glance to be a small doll! From 2030 - 2130 hr we road hunted from Playa Hermosa to Sardinal, back and past to Playa Paravá, then back to the cabins: 1 screech owl (?) flew across the road & landed on a limb in view; 1 DOR yearling Crotalus durissus; 1 DOR & 1 AOR juvenile Trimorphodon biscutatus, the latter of which (both TL's  $\approx 70$  cm) thrashed and bit when held; several Bufo marinus; several Bufo, some brown and cf. B. valliceps (not here according to Savage) and some yellowish-green w/ small paratoid glands, cf. B. leutkeni; an adult Didelphis marsupialis, slender w/ an obvious lateral facial black stripe; and a  $\approx$  neonate Portia ophryomegas AOR. The latter was frozen in a slow lateral undulating posture when I stopped, and in the poor light I mistook it for a colubrid! Luckily Wendy, who got to it first and reasonably, especially given my comment ("It's not venomous"), thought it might be a Leptodeira or Trimorphodon, didn't pick it up! When touched w/ my shoe the little pitviper crawled, coiled and struck rapidly.





Greene, H.

1991

June 23

A pretty restless night. Wendy is in one bed, plagued by mosquitos that are largely ignoring me despite the fact she is wrapped up like a mummy w/ the fan on. I'm on the other, so warm I'm sweating w/ no sheet, tossing in and out of sleep.  $\approx 0400$  hr I feel several fingers make 3-4 bouts of rhythmic tapping on my head and as I slowly come to consciousness I think it must be one of my own hands, neurologically disembodied from having laid on it. As the weird thumping recurs I gradually perceived that each of my hands was elsewhere! So I jerk upright and see a dark oblong form fall from my head to the bed-wall border, then run and jump in what looks like rodent-like locomotion. Oh shit, I think, a rat on my head, so get my light to prevent it getting onto Wendy later and find the animal in my duffel bag, - one of the yellow-green cf. Bufo lentherii! There are 3 German shepherds here, a very old and tranquil female & her two large puppies. Twice the pups have tried to make off w/ our wet shoes in front of the cabina. Last night during dinner all three were collapsed on the dining room floor, as if the air had been let out of their tires. At breakfast this AM I spied a ♂ Gonatodes active  $\approx 1.5$  m up on a palm



Greene, H.

1991

June 23  
(continued)

lurch, and thereafter a big ♂ Ctenosaura descended head-first from  $\approx 5-6$  m up a tree - and doing it pretty gracefully at that. Albani showed up for our appointed second try for Pelamis at 0900hr, says we will go at 1000hr. At 0950hr I spotted another ♂ Gonatodes scuttling along a low wall; it stops, wags tail, & repeats. I crept closer and saw a ♀ (I think of that species) hiding nearby on the edge of a palm trunk. We left to search for Pelamis soon after 1000hr, returning before noon ( $\approx 1\frac{1}{2}$  hrs.): Albani, a younger tico w/ him, and a tico in his 20's I'd guess and his father (the last two added w/ no explanation nor contribution to the costs). We went deep into Bahía de Culebra, but again saw no slicks nor snakes. The drive back was slow because of numerous trucks full of cattle - a little weird creeping up a winding road in the wake of a black smoke belching, board enclosed truck, its milling cargo looming just in front of and above your hood! Turned in the car after hours at  $\approx 1750$ hr, thanks to the cooperation of a very helpful young man named Alirio.

June 24

La Selva Biological Station, Heredia Prov., Costa Rica arrived here  $\approx 1030$ hr, and Wendy's two volunteer assistants from the States (Charles Bauch and Heidi Robeck) tell us that it has scarcely rained since she left. Spent the day unpacking and otherwise settling in. OTS course arrived.



Greene, H.  
1991

June 25 I spent the day leading orientation walks for students in the OTS course w/ Bob Marquis. On each of three we saw 1 Eleutherodactylus transfordi and one or more Anolis, and a total of 2 small groups of Ateles.

June 26 Today we went w/ Rios Tropicales, a commercial river rafting outfit, on a beginners' level trip on the Rio Sarapiquí between La Virgen and Chilarote. As we put in at the bridge on the south end of La Virgen  $\approx 1000$ h, a large ( $\geq 2.5$ m total length) Spilotes pulatus appeared swimming (not frantically) from the west side and made more than half way across before sweeping downstream  $\approx 50$  m to an area of rapids. The snake swam in wide lateral undulations, always head upstream and w/  $\approx$  the anterior  $1\frac{1}{2}$  - 2 m easily visible - I suspect it was inflated. We were surprised it could maintain position in the rapids, which it did for a couple of minutes before achieving the boulder covered west bank and disappearing from our view. There were 7 in the raft: Ann Weekes (architect, U. Florida), Brian Tsaw (undergrad, Harvard), Wendy, Heidi, Charles, me, and our boatman; other boatman traveled separately (usually ahead) in a kayak. We put out between Chilarote and La Guaria  $\approx 1300$ h, having run numerous up to "Class





Greene, H.

1991

June 26  
(continued)

3" rapids. Twice we saw Zutia longicaudus, once two w/ a meter of each other and a few meters of us, and we saw literally dozens of latrines — one we checked had four piles of two distinct colors (ages?), each full of crustaceans. Wendy spotted a latrine at the mouth of a cave in the riverbank, perhaps a den. After dinner Wendy and I checked the Cantarana Swamp at 1930 hr and saw 1 Azalychnis callidryas (1 m above swamp on leaf), several Hyla ebracatta on leaves, a large Smilisca baudini on a twig  $\approx$  4 m up in a Pentaclethra in the swamp, but no snakes. We walked to CCH 750 m to check an egg site for Azalychnis calcarifer — we had photographed the egg mass and 3 tadpoles yesterday afternoon. Walking out and back we saw 6 Anolis limifrons sleeping on leaves 0.5 - 1.5 m above ground beside the trail, a big ♀ Eleutherodactylus fitzingeri on the trail, and a pair of the latter a few cm apart on a rotten limb on the ground. All this in light rain, very bright ( $\approx$  full last night) moon. The Cantarana was fairly quiet when we returned, but at 2126 hr there was an adult Smantodes inornatus  $\approx$  1.5 m above the water in the Pentaclethra just N. of the boardwalk at the west end, crawling upward on a moss covered branch — only partly visible.



Greene, H.  
1991

- June 27 Bright and sunny at breakfast. I walked SURA to LOC and back in CES, spending some time off trail  $\approx$  550 CES where we've seen Lachesis and Lampropeltis in the past. At 1015 hr as I walked out to the boardwalk at CES 425, a Porthidium nasutum (242+24 mm, 12.3 g) crawled at my feet; turned and snapped when seized w/ forceps. Walked length of SOR before lunch. At  $\approx$  1600 hr Wendy and I checked the Ozalychnis calcarifer clutch at CCL 750, then a new one Brian found off trail at CCL 250 - took lots of photos. At 1930 hr Charles found an adult Micromys nigricinctus ( ) crawling slowly in leaf litter just off the SOC near its origin; withered and bit repeatedly when grasped w/ forceps, but did not tail display. ~~At~~ We walked to CES 600 and saw only 1 Eleutherodactylus; others calling. At  $\approx$  2045 hr we caught a reddish-brown Leptodeira septentrionalis ( ) crawling against the wall of the River Station bath house.
- June 28 From 0930-1100 hr I walked SURA to LOC and back by CES. Sunny, lots of Ameiva. OTS students brought in an adult ♀ Ozalychnis calcarifer that "jumped into an insect net" as they stood around the egg site at CCL 250 - and there is a new egg mass there now too. <sup>81 mm 28g</sup>
- June 29 From 0800-1130 hr walked SOR-SHO-SUA-CCC and to the waterfall w/ Wendy. We checked out several sites



Greene, H.  
1991

June 29  
(continued) for track sampling stations.

June 30 Walked transect to consider track stations. Visited breeding sites of Azalychnis calcarifer. From 2108-2125hr I watched a small adult Imantodes inornatus in a Ficus "bush" in the Cantarana, by the "14" sign. The snake spanned gaps from twigs to the tops of foliage clusters, and across foliage clusters, but never extended out and down onto a cluster or leaf as does L. cenchoa. There were numerous volleys of tongue flicks as it traveled over the out part of the bush. I estimate it searched  $\approx 6$  cubic meters of foliage in 15 minutes.

July 1 Walked the vertebrate monitoring transect w/ Charles Bauch this afternoon - at 1515hr,  $\approx 540$  500m, we missed a juvenile Bothrops asper as it crawled off the trail into forest litter. At 2036hr w/ Heidi Robeck I caught an adult Leptodeira septentrionalis on the ground at  $\approx 500$  400; it was crawling slowly when first found, but crawled fast, then withered, discharged its cloacal contents, and bit repeatedly. At 2146hr there was a small adult Imantodes inornatus in the Ficus bush near "14" in the Cantarana.

July 4 Things have been fairly chaotic here, and I've let several items go unnoted - some to be added later than they occurred after getting dates from Wendy or



Greene, H.  
1991

July 4  
(continued)

Charles' notes. at 1934hr tonight on SOR  $\approx$  300  
I caught a Leptodeira septentrionalis that willed  
and cloacal discharged when handled

July 5

Dave and Billy Hardy, and Ardell Mitchell arrived today.

July 6

W/our entire group, we conducted litter searches of  
10, 5 X 5 m quadrats near the junction of  
SSO and SHA (data separate).

July 7

Walked the vertebrate transect this AM (data separate).  
at  $\approx$  2245hr Heidi Robeck called me to a  
Leptodeira septentrionalis (9515 + 140 mm, 20.7g)  
at SOR 50, which she found on the ground  
eating a Bufo marinus (6.8g, preserved). Snake was  
just starting over the head when she encountered  
it and started timing; 14 min. 10 secs. later it  
swallowed the toe tips. Regurgitated as soon as  
I picked it up. interesting to note: not much rain  
since I arrived, and both the site (ground) and  
prey (Bufo, not hylid) are non-modal; L. septentrionalis  
can behave like L. annulata (as in this case) but  
probably not the reverse - the latter is heavier  
bodied and probably can't climb to eat frog eggs.

July 8

Walked the monitoring transect - data separate.

July 9

Last night began a period of heavy rain, finally.  
Until now we've had only occasional brief showers -  
the forest seems dry, frog activity is low both in  
the forest and swamps. This AM Wendy showed  
me the spectacle I've heard of for years, mass





Greene, H.

1991

[See also July 24, 1991]

July 9  
(continued)

breeding in Dzalychnis saltator. Although there was scattered activity elsewhere, most was concentrated just south of the boardwalk  $\approx$  midswamp. A liana 3-4 cm in diameter hangs straight down from a Pentaclethra tree as a single strand to 3-5 m above water, then anastomoses in a tangle suspended down to about the tops of the Spathophyllum, at which point it is adjacent to a bush w/ a big bromeliad in the middle. When I arrived  $\approx$  0630 hr there were 100-150 frogs, perhaps  $\frac{1}{3}$  in clasped pairs, clamoring up and down the vine tangle. The overall impression was of a rete mirabile (sp.) of green bodies, orange feet, and red eyes superimposed on the plants. Movement was rapid: frogs climbed lemur-like up and down the vines; fought over females; leaped several meters at times, absorbing the shock on bouncing broad leaved plants; and all the while a chorus of soft single note chuckle calls. By 0900-1000 hr the whole mass was moving up  $\geq 10$  m to the lowest major tree bough adjacent to the vine, and I could see w/ binoculars several frogs perched in the tree, perpendicular to their branches. Wendy has more detailed notes. From 1930-2015 hr I could find no snakes in the Carlarana, but David Hardy saw a Leptodeira septentrionalis on the vine tangle of this morning's spectacle at 2230 hr.



Greene, H.

1991

July 10

Walked the vertebrate monitoring transect this AM.

July 11

Another Agalychnis saltator spectacle this AM - Wendy has detailed notes. at  $\approx 1015$  hr I saw a

yellow-rumped warbler eating eggs of saltator just north of the Cantarana boardwalk, on moss covered vines  $\approx 1$  m above water. The bird was

perched on the verticle vine for  $\approx 15-20$  secs., delivered 1-3 pecks very rapidly, then swallowed (head jerked, bill movements while back from vine;

there were at least 5 "swallowing" events during the bout. at 1038 hr I saw a juvenile (carapace

$\approx 75$  mm) Kinosternon leucostomum basking on a branch in sun among emergent "grass" near the east end of the Cantarana Swamp - its

yellow head stripes were obvious, although I first noticed the glint on its shell. at  $\approx 1400$  hr

there was a total solar eclipse. People had flocked from all over to Guaracaste where viewing was so

have been good and was in fact obscured by clouds. We've had heavy rains here for the past

few days, but our experience was great! Ronald Suarez had a TV on the covered porch so people

there could see in on the screen and in the sky! Wendy and I and a group of OTS students

w/ John Vandermeer were in the swamp. Frogs calling (Gastrophryne pictiventris, Smilisca baudini, Hyla elaeochroa) seemed to surge at peak



Greene, H.

1991

July 11  
(continued)

darkness, which lasted only 3-4 minutes. Leaves on a Pentaclethra seemed to partially close. At the corridor, toucans and parrots flew over as at dusk, then flew back a few minutes later w/ returning light. The sky was heavily overcast during most of the eclipse, but clouds parted in just the right place at just the right time to give us a fantastic view of max. eclipse - a dark ball surrounded by wavy corona. The darkness seemed to come on in increments rather than smoothly, and at max seemed to me like  $\approx$  1815h here normally - almost too dark to see anything w/out a light. At the moment of total eclipse and our view of it, spontaneous yelps came out of our group - and Wendy and I talked about how such things must affect aboriginal people. Perhaps not entirely unrelated: tonight we watched a video cassette Ardell Mitchell brought down of a recent David Attenborough nature series, w/ two especially stunning sequences. Orcas beaching in Argentina to catch sea lions, then tossing them around in the sea. Chimps ganging up to trap, kill, and eat a red colobus monkey - then the whole troop erupting in a screaming frenzy. Hard to avoid a connection w/ humans. And later in the evening E. D. Brodie III saw an ocelot (Felis pardalis) w/ a half eaten "large" <sup>or rabbit?</sup> prey - perhaps paca?



Greene, H.  
1991

July 12 This AM I walked the vertebrate transect - data elsewhere. Heidi Rohech left. Cortarara Swamp is full and the Rio Puerto Viejo runs high and brown - we've had lots of much welcome rain the past few days.

July 13 Walked the vertebrate transect this AM w/ Ardel. Showers off and on all day; clear sky w/ stars after dinner - still almost blue, moon just a sliver. I walked out CES to release snakes and was soon drenched in sweat - a heavy humid night. at  $\approx 2130$ h I checked the Cortarara Swamps and saw two Leptodeira septentrionalis south of the boardwalk in vegetation above water: an adult in the large tree near "14",  $\approx 2$ m above water, crawling slowly along a limb - it paused head down a verticle vine then crawled by; and an adult at the edge of the mass of moss covered vines where Azalychnis saltator bred a few days ago - the snake was coiled three times around a horizontal branch, the loops vertical and adjacent such that its belly faced me, and its head was suspended a few cm below to moss and was jerkily plucking saltator eggs from the moss,  $\approx 1$ m above water.

July 14 This afternoon I walked the vertebrate transect w/ Dave and Ardel, first time when we haven't gotten soaked in several days. Then a float trip in the Rio Puerto Viejo w/ Dave, Billie, and Wendy. Walking to Rafael's house, Wendy spotted a large adult





Freere, H.

1991

July 14  
(continued)

Chelydra serpentina walking slowly on the bottom in shallow water at the edge of Quebrada El Salto under the cement bridge. After dark David Hardy saw a Leptodeira septentrionalis eating Agalychnis saltator eggs on a moss covered vine in the Cantarana Swamp, at the site where we watched the breeding aggregation a few days ago.

July 15

This morning I walked the vertebrate transect w/ Ardell. Last night Wendy learned still another friend of hers has been injured in a climbing accident, probably mortally - the third this year for her. At  $\approx 1600$  hr we went  $\approx 100$  m off trail to the NE of the CES/CEN junction to see a peccary (Tajacu tajacu) wallow reported to us by David Clark. Several have been seen (wallows) the past couple of years, an apparently new phenomenon at La Selva. Wendy found the spot, walked right to it w/ a compass bearing, and as I came up a peccary sped past a few meters from me - a gray blur among the understory palms. The wallow is several shallow connected pools in a single bare muddy depression, w/ peccary tracks everywhere and a strong odor of these animals. We saw no tadpoles. At 2130 hr I spotted an adult Imantodes inornatus horizontal on a moss covered branch of a sappling,  $\approx 2.5$  m above the entrance to the Cantarana at its west end - right next to a low palm where twice (?) last December I saw this species on the palm leaves early in the evening. The snake was stationary, facing the tree trunk from  $\approx 30$  cm out, w/ neck straight for



Greene, H.  
1991

July 15  
(continued)  $\approx \frac{1}{5}$  of its length and the rest in  $\approx 5$  shallow alternating loops — was it waiting for a frog? at 2132 hr a Ninia maculata crossed the path to the River Station — flattened and writhed when seized.

July 16 Slept all AM — feeling lazy and bored. From  $\approx 1330$  — 1600 hr Ardell and I walked the vertebrate transect and check the two Agalychnis calcarifer sites on CCL. at 2124 hr I found an Imantodes inornatus, same size and on same branch as last night, except now  $\approx 30$  cm ( $\geq \frac{1}{3}$  TL) is extended down the sapling's trunk; head is tilted out at slight angle. at 2133 hr I found a Leptodeira septentrionalis  $\approx 1.5$  m above water at the swamp edge, east end of the Cantarara at  $\approx 3$  m S. of the boardwalk, crawling along a horizontal limb  $\approx 3$  cm/second. at 2141 hr the Imantodes is going down off (into the center) of a palm frond adjacent to the sapling — same palm as one was stretched over in December — and thus has moved  $\approx 2$  m since last sight.

July 17 This AM I walked the vertebrate transect w/ Wendy.

July 18 This afternoon I walked CCC  $\rightarrow$  550 to 950 m and back to CCC  $\rightarrow$  CCL  $\rightarrow$  50K to the River Station, checking and photographing the old (last year's) Agalychnis calcarifer breeding site — now filled w/ leaves and detritus and unused, although a little water has pooled at one edge. Yesterday AM Ardell went for a long walk, came back, sat down on a bench exhausted, and caught a



Greene, H.  
1991

July 18  
(continued)

neonate Spilotes pullatus on the chain next to him!  
Ronald Suarez will later send me a photo of a Spilotes  
(or Pseustes?) seen earlier this year raiding a bird's  
nest near the corridor. Orlando Vargas showed me a  
color print photo of a Clelia clelia eating an adult  
Bothrops asper, taken by Jansie McHargue.

July 19

at 0200h Mark, an undergraduate from U. Oklahoma working  
for Ola Finke, showed me an adult Lachesis muta at  
CCC 125m. Mark and a British woman woke me (a surprise!)  
after encountering the snake when they came in from  
checking tree holes for damselflies. The snake looked  
like a small adult, probably  $\approx 1.6$ m total length. It  
was  $\approx 30$  cm from the boardwalk on the cleared trail on  
a slope, coiled tightly, round,  $\approx 3$  complete rings of body  
loops w/ head up on them in an abt. S-coil and facing  
downslope parallel to the boardwalk. Head and  
foreparts parallel to the ground. I returned  $\approx$   
0630h and couldn't find the snake. Yesterday  
Devin Graham (U. Miami) saw a collared forest falcon  
(Micrastur torquatus) fly up in one of his plots, and  
w/in 30 min. found a  $\frac{1}{2}$  eaten  $\frac{1}{2}$  grown agouti on  
an elevated fallen tree trunk - head & foreparts gone,  
entrails removed through the front, no smell and few  
flies. Last year Devin and Emmett Blarhenship  
(Auburn U.) saw a large snake they thought was  
Clelia clelia eating a young armadillo (Dasypus  
novemcinctus! I wonder if it was a Drymarchon



Greene, H.  
1991

July 19 corais since the incident was diurnal and that  
(continued) snake has a catholic diet.

July 21 Returned from San José just after noon by bus (soccer game  
blaring over the radio), having seen Wendy off on a plane  
yesterday so she can attend her friend's memorial service.  
In the interim Ardell Mitchell processed 4 snakes: Spilotes  
pullatus (520 + 155 mm, 30g, ♂), Leptodeira septentrionalis  
(570 + 166 mm, 33g, ♀), Leptophis ahaetulla  
(800 + 476 mm, 65g, ♀, perhaps 4 eggs), and Boa  
constrictor (570 ~~mm~~ + 77 mm, 90g, ♂). Another  
somewhat smaller boa was also found w/in the last few  
days in the workshop (and this one on the suspension bridge)  
making us wonder if a litter was dropped somewhere near  
the comedor. This afternoon my roommate, Gustavo  
Vargas, was attracted by frog calls to what he thought  
was a small Lachesis holding a cream or brown  
large frog - he has a photo, hopefully, which  
might resolve the identifications. At  $\approx 2200$ h I passed  
through the Cantarana Swamp - water is  $\geq 30$  cm over the  
boardwalk, but no rain since this AM. Hyla abacatta &  
H. loganax calling, 1 ♂ Agalychnis saltator on a palm  
leaf  $\approx 1$  m above water. An Anantodes inornatus of same  
size in same place as on July 16: on horizontal branch  
w/ head  $\approx 10$  cm from the main trunk, posture as before.  
Last night Devin Graham found cf. Synbranchus  
wiggling in the ditch beside SOR  $\approx 400-600$  m, TL  $\approx 15$  cm,  
which I will use for frog egg palatability trials.





Greene, H.  
1991

July 22 Walked the vertebrate transect this AM w/ Paula Skilling (reptile keeper, Dallas Zoo) - in addition to numerous small herps (see separate data sheet) we saw several nice tracks of cf. Felis concolor and cf. small Panthera onca on the SUA, going toward CC. Gustavo Vargas saw cat tracks further out the CC. After lunch I hiked CES  $\rightarrow$  LOC  $\rightarrow$  SAT 1200 to see cat tracks reported by Mike Keller, but found and traced only cf. Nasua. On the way out I met Gustavo, who directed me out Sendero La Chanchera for more tracks; saw numerous tracks of Nasua and 1 dd cf. Felis pardalis. On CEN and SOC, the latter where Devin Graham had reported a cat track, I traced what might be Canis latrans. Isais Alvarado told me he has heard coyotes in the Puerto Viejo region recently, and supposedly a guard here saw one this year. Also might be a dog.

July 23 Rained most of the night before dawn. On the 21st  $\approx$  2030h I caught a Leptodeira septentrionalis crawling beside the library (545 + 152 mm, 36g) and palped from it the hind toes of a juvenile Bufo marinus; snake thrashed, bit, and cloacal discharged while handled. Yesterday Devin Graham brought in a Tartilla melanocephalus (273 + 90 mm, 6.0g, ♂), caught  $\approx$  0600h crawling near the River Station. This afternoon Orlando Vargas walked to the three sites for Oxalychnis colcarifer to identify plants. At 550 850 m, where Wendy Roberts studied last year, the



Greene, H.

1991

July 23  
(continued)

log is a marked GAPS project tree, Pentaclethra  
macroloba; Julie Denlow should know when this tree fell.  
The breeding cavity is now filled w/ large dead leaves and  
although there is a little water no evidence of frog breeding.  
There are numerous leaves of Philodendron <sup>(Araceae)</sup> inaequilaterum  
hanging right over the cavity. The overall site is heavily  
overgrown, and I got moderately severe chemical burns  
from some plant nearby. At CCH 750m the tree is  
a P. macroloba; the plant w/ the old jelly mass  
attached is Syngonium sp. (Araceae). The large  
immature palm arching over the tip-up is Welfia  
georgii (Palmae) as Wendy thought. There is another small  
palm sapling (Bactris wendlandiana) growing straight  
from the tip-up through the Syngonium w/ its fronds  
on the opposite end of the water-filled cavity. At  
CCH 210m the fallen tree is another P. macroloba  
(Mimosaceae); the marked plant near one end of the  
water-filled cavity is P. inaequilaterum. Orlando  
pointed out that P. macroloba is the commonest forest  
tree, the commonest treefall, and that its wood is  
resistant to decomposition; also it has very little  
buttressing. See Hartshorn's (1983) account in  
Costa Rican Natural History -- sounds like the range  
of A. calcarifer might match one of the three  
disjunct populations of P. macroloba. At 1444h  
I grabbed a subadult Rhadinaea decorata as it  
crawled into leaf litter on the CCH; it thrashed



Greene, H.

1991

July 23  
(continued)

and discharged a foul cloacal substance when handled. From  $\approx 2130-2240$  h I worked the Cantarana Swamp but saw no snakes; heard Hyla logarum, saw 1 ♀ and  $\geq 5$  ♂♂ Azodychnis saltator.

July 24

More hard rain before dawn and on the way to breakfast I hear Hyla elaeochroa in the Cantarana, but don't go in because it's above boot level on the boardwalks! From 0800 - 0930 h Paul, Gail Mitchell, Ardell and I checked the CCL 210 and 750 m a. calcarifer sites. The water cavity at CCL 210 m is 5.7 m long, crab hole to crab hole. Then Paula and I donned waders and used Ardell's rangefinder to check some aspects of the a. saltator site in the Cantarana. The mass of moss-covered vines starts  $\approx 1.4$  m above boardwalks level, and is 2.9 m from the nearest railing in a horizontal path; it ends ~~4.45~~ 4.45 m up a hypotenuse to the vine; and the single verticle vine "ladder" hits the leafy Pentaclethra branches where frogs spited at 9.7 m up a hypotenuse from where I stood. After lunch I received a preserved Micurus nigrocinctus that might have killed a woman, from Ronald Suarez. An elderly neighbor of his mother's complained of not feeling well after having been "spined" by something in her garden, and died a few hours later as



Greene, H.

1991

July 24  
(continued)

apparent respiratory collapse and/or heart attack. The coral snake was killed in the garden, but not clear to anyone if it really bit her. He says coral snakes are encountered commonly, and he has seen children playing w/ them. Today 2 neonate Boa constrictor were found, one beside the ice machine on the porch of the lab, the other near a cabina — and two others on the other side of the river last week.

July 25

More rain before dawn — streams are flooded, ground saturated. Last night Ardell and Gail caught an enormous ♀ Bothrops asper (1875 + 246 mm, 2.7 Kg) crossing CES at 450 m. This morning we palped a Teloneus (148.545 mm ±) into her w/out problems. I spent the late morning and most of the afternoon arranging for storage of gear, burying rotten fish (!), etc. ~1600 hr I walked to the Agalychnis saltator site at CCL 750 m to collect a tadpole, then found a new nest at CCL 210 m that wasn't there yesterday AM. This clutch is on the curved vertical surface 4.5 cm above the water & 43.5 cm from the E. (right as one faces the pool having stepped over the log) end of the pool. The jelly is clear and shiny, the egg capsules slightly opaque, and the eggs orange w/ a dark spot on the upper part. The mass is irregular, maximum width ~55 mm near the top & 5 eggs wide; 4 eggs wide near the bottom; and 82 mm in greatest





Greene, H.  
1991

July 25  
(continued)

vertical dimension. The mass is 2 eggs thick for most of its mass, 1 egg thick on the edges. I counted 32 eggs each of three attempts, although I possibly missed 1 or 2 inner eggs. There is clear jelly around and over the mass, and one apparent eggless capsule at the bottom tip. The eggs are beautiful, quite stunning really. Somehow the mass seems to glow, at least in my mind - something like optimism is those green embryos, amidst all the mosquitos and decay. Walking back between the River Station and the Lab clearing I was passed oncoming by a foraging Tamandua mexicana. Coming back from dinner I watched a Conopatus semi-striatus foraging beside the sidewalk - it progressed slowly (I walked very slowly to maintain distance), nose down and tail always up. The tail of this skunk is meager relative to U.S. species, pale gray or off-white, maybe <sup>(or less)</sup> 2-3 cm diameter and uniform color and shape - and always straight up. I don't think it perceived me so was impressed that the "defensive display" was continuous while foraging. Big frog chorus in the Cantarana Swamps  $\approx$  1930hr despite a very bright moon. Went back  $\approx$  2130hr w/ the class of Jeda Muñoz. Despite a luminous mist such that



There, H.  
1991

July 25  
(continued)

I could see plant forms w/out a flashlight, there were frogs calling - Hyla loguax, H. ebraccata - and  $\geq 6$  ♂ Agalychnis saltator on leaves and branches.

We saw an adult Imantodes innomatus immobile on a sappling  $\approx 5$  cm in diameter - stretched down the trunk almost straight, w/  $\approx 15$  cm of neck hanging out and down towards the nearby ( $< 0.5$  m) water.

July 26

Rain before dawn - very hot and humid after breakfast when we released the big ♀ Bothrops asper - she simply crawled rapidly out of sight. I leave the station today, go back to Berkeley tomorrow.

August 3

Portal, Cochise Co., Arizona

Arrived here at the Hardys' house  $\approx 2030$  hr, having left Berkeley  $\approx 1330$  hr yesterday and Barstow at 0700 hr this AM. Drove down Hwy 666  $\approx 1700$ -1830 hr today to Douglas, hoping for Sistrurus but seeing only a pink Masticophis flagellum DOR right after I left I-10. Big storm to the NE as I drove up Hwy 80 from Douglas to Rodeo, at I saw only a single Crotalus scutulatus on the road.

August 4

Went w/ Dave Hardy, Barney Tonberlin, and Tony Snell  $\approx 0815$  hr and found Crotalus molossus ♂ #3 <sup>148.784 mm</sup> in the center of a large bush, on the ground in a tight coil w/ head horizontal and to edge of outer loop. at 0945 hr driving from the store to the Hardys' a neonate Thamnophis cyrtopsis crossed the road in front of us. The Hardys left for Tucson after lunch. at 1615 hr I



Greene, H.

1991

August 4  
(continued)

located C. molossus #3  $\approx 50$  m east of this AM's site, across the road (S. side). Snake is stretch out w/ slight curves, immobile, and slow tongue-flicks - probably saw me. It is on the N. edge of the bottom of the Silver Creek channel, amidst junipers and rocks. I head back, and 1.3 mi. W. of Portal Rd. on the Paradise Rd. at 1630hr I see an adult ♀ C. molossus (930 + 69 mm, 455g) frozen, rod straight in mid road, head up-slope. She coils, rattles, and makes a couple of flash strikes as I catch her w/ tong. Drove down to Hwy 80 and back. at 1735hr C. molossus #3 is on the N. side of the road near the top of a 4 m high embankment,  $\approx 50$  m farther E. of last site. Snake is stretched out w/ faint curves, immobile, head turned back toward me (I approached on the road). I walked W. to truck, drove down & checked embankment w/ binoculars at 1740hr - no snake! at 1751hr I found him stretched in open, immobile,  $\approx 30$  m NE of last site. I dropped to ground out of view and w/in seconds he resumes crawling slowly, mainly rectilinear, w/ lots of tongue flicks. Travels  $\approx 20$  m to the W. by 1806hr when I leave. After dinner I road hunted to Hwy 80 on Portal Rd., got only two fresh int ♀ adult Pituophis; saw 3 dead neonate, 1 dead small adult, and 1 live small adult. C. atrox.

August 5

I located C. molossus ♂ #3 at 0847hr,  $\approx 75$  m NW and uphill from last site, crawling stretched out under a



Dreese, H.

1991

August 5  
(continued)

juviper. By watching his head then whole body crawl past a rock I timed him at  $\approx 1\text{m}/34\text{secs}$ . Tongue flicks almost continuously, head makes small lateral movements, and he flows over the substrate (photos). As I head back for water and a snack to carry in search of #8, <sup>at 0909h.</sup> 5 juveniles (Tayasu tajacu) crossed single file going up from the sycamores in Silver Creek to the center of our study area. They are strikingly larger than those I saw last month at Ja Selva, and have been bathing - their hair is wet and matted. at 0920h I hear a possible rattling in an Opuntia at roadside as I pull up to the Hardys' house - sure that it's some sort of insect, I check anyway and catch an adult ♂ Crotalus molossus (1025+73mm, 732g)! I started walking up the little mining road opposite the picnic pullout at our study site at 1000h and at 1040h located C. molossus #8  $\approx 100\text{m}$  N. of the crest of Limestone Mountain ridge  $\approx 200\text{m}$  E. of the mining road. He is in a pile of reddish rocks on a SW facing or W facing slope, partly exposed to sun from down among the rocks. The snake was coiled tightly w/ head tilted up the inner edge of an outer coil, and rattled once as I clamored down for a look and photos. at 1145h I find C. molossus #3  $\approx 300\text{m}$  W. of last site, just N. of and below crest of ridge between road and a ravine that runs under the one lane bridge to join Silver Creek. Early it was





Greene, H.

1991

August 5  
(continued)

partly cloudy and warm, now it is hot! The snake is in shade under a 4 m tall juniper, stretched upslope but w/ head drawn back into a tight S-coil beside the tree trunk. I sit 3 m away and leave at 1200 hr, and the snake's head has turned downslope. At 1239 hr as I drive up to the paved Cave Creek Rd. from the Hardys' dirt road, I catch an adult ♂ C. molossus (1135 + 80 mm, 1.12 Kg) as it crawls slowly and straight into adjacent brush. Spent the afternoon processing snakes and visiting Wade Sherbrooke at the SWRS, who gave me 2 frozen Crotalus. At  $\approx$  1800 hr Barney Tomberlin caught a small ♂ C. molossus (785 + 52 mm, 287g) in the yard of folks SW (up canyon) from the Hardys - thus the third today around their house. I drove after dark to Hwy 80 on Portal Rd. and back, saw only an AOR C. atrox.

August 6

at 0809 hr I found Crotalus molossus ♂ #3 stretched at the top edge of embankment on N. side of Paradise Rd., in general area where he was on afternoon of the 4th - thus he has returned  $\approx$  300 m since yesterday. At 0824 he started crawling E. at  $\approx$  2 m/minute w/ almost constant tongue flicking; at 0830 hr. I lost him - I thought he was searching for a slope to cross down to the road. At 0845 hr I relocated the snake  $\approx$  3-4 m N. of the edge in open grass and acacia, crawling more slowly -  $\approx$  5 m by 0850 hr.



Greene, H.  
1991

August 6 (continued) The snake spent 3 minutes crawling through and tongue flicking a patch of grass and small shrubs no more than  $20 \times 20$  cm, and spent the rest of the time moving slowly - always tongue-flicking and pushing its head into vegetation. I wonder if it's on the track of a ♀. At 0903 hr it has again covered 5 m in 5 minutes, going uphill, and now crawls up over a 0.4 m high shrub and disappears. At 1033 hr I find the snake in a tight coil at the base of a 4 m juniper,  $\approx 30$  m from last site, its head pointed at the base of the juniper trunk (photos). By 1130 hr, back at the Hardy's, a slow rain is falling. At 1414 hr a large Masticophis bilineatus zips across Cave Creek Rd in front of my truck,  $\approx 200$  m SW of the turnoff to Paradise.

August 12 Returned here after attending the SSAR meeting in Pennsylvania. Arrived  $\approx 1615$  hr. At 1728 hr I located Crotalus molossus ♂ #3  $\approx 200$  m S. of the road, perhaps 400-500 m SE of where I last saw him. The snake was in a tight coil w/ head up in an S-coil, as if hunting - among open grass on cobbles in a small gully just below the edge of a much larger ravine, a branch of Silver Creek. I took two photos, and as I moved w/in 3 m for the second he turned toward me - no rattling. Barney Tomberlin told me that two students from Cal Poly Pomona, last night on Hwy 80 in Hidalgo Co., New Mexico, found



Greene, H.

1991

August 12  
(continued)

DOR a "three foot" Lampropeltis getula that had eaten a "two foot" Rhinocheilus lecontei. Dave Hardy and I road hunted up to our Crotalus molossus study site, then E. to Hwy 80 in New Mexico, but found only a small adult Hypsiglena torquata.

August 13

at 0801hr Dave and I located C. molossus #3 on the SE bank of a large branch of Silver Creek,  $\approx 40$ m SE and across the ravine from yesterday. When sighted he was stretched out on dead leaves among oaks and shrubs, and frozen when we first saw him - turned head as Dave approached, but no rattling. at 0805hr he resumed crawling ENE parallel to stream channel. We watched him until 0816 - crawling  $\approx 2$ m/minute, body almost straight, constantly tongue-flicking. at 0938hr we found C. molossus ♂ #8 on the main Limestone Mtn. ridge,  $\approx 500$ m WSW of the highest peak. The snake was in a crevice under a boulder ( $\phi < 1$ m) w/ a loop of  $\approx 30$ cm and including the stomach out in bright hot sun - took photos. Dave spotted the head pointed at us from inside a side hole under the rock, but we saw and heard no reaction. at 0950 the snake had retreated out of sight while we talked a few meters away. This site is  $\approx 400$ m E of where I last saw the snake. at 1105hr we found C. molossus ♂ #3 on the NW (opposite) side of the ravine he was in earlier, now above the edge



Greene, H.

1991

August 13 (continued) and perhaps 200 m S. of the ridge point across the road. He is in deep shade, a tight flat coil w/ head in center near the base of one of three large contiguous juniper trees. Spent much of the afternoon preserving some snakes Barney Tomberlin gave me frozen.

August 14 Dave and I located Crotalus molossus #3 at 0738h  $\approx$  20 m NW of yesterday's last sighting,  $\approx$  10 m S of culvert on W. bank of the ravine. The snake was well up on the slope in shade of a low bush, in a flat tight coil w/ head and neck in an S-coil and down in coils. I then left for Tucson to pick up Sally R. Zamudio ("Kelly") who is flying in from California to visit the SWRS. at 0933h I hit an adult Masticophis flagellum on the Interstate highway as it crossed - went back and saved it to preserve. at 1510h as we drove back into the Chiricahuas, 1.4 mi. NE of Paradise on the dirt road from San Simon, Kelly heard a rattle at roadside and we backed up to catch a Crotalus molossus ( $\sigma$ , 753 + 56 mm, 303g). Snake was rattling from an S-coil when I pulled it out of dense vegetation at roadside. at 1700h Kelly, Dave, and I found C. molossus #3 stretched out in open low vegetation,  $\approx$  3 m below the road edge,  $\approx$  30 m E of the culvert on N. side of the ravine - thus is maybe 50-60 m from this AM. at SWRS I talked to Robin Andrews, who today saw





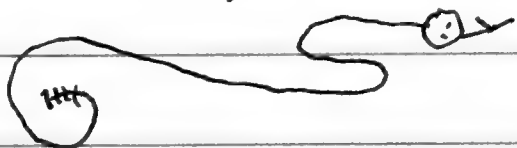
Greene, H.  
1991

August 14  
(continued)

a Sciurus - Crotalus molossus interaction. She noticed the squirrel pushing a little embankment of dirt, and saw it was facing a "3 ft. long" blacktail in pre-strike posture. a woman named Marge, of the SWRS kitchen staff, saw what she took to be two C. molossus mating - but Kelly questioned her and learned one rattler rushed the other, whereupon they rose entwined - thus surely male-male combat. We road-hunted to Arivacas, New Mexico and saw one each C. atrox, C. scutulatus, and C. viridis.

August 15

Driving down from SWRS where I picked up Kelly, we saw a Urocyon fox cross the road in scrubland near the Forest Service entrance in Cave Creek Canyon. at 0836 hr we located C. molossus #3  $\approx$  75-100 m ESE of the under road culvert, coiled flat in grass at the edge of a clearing, next to an Opuntia. at 0912 hr, as we huddled up Limestone Ridge, Kelly spotted a large ( $\geq 15$  cm) Scelopendra crawling at the base of an Opuntia patch among boulders - it was walking leisurely, swinging the head side to side, seemingly unaware of us. at 0957 hr. we found C. molossus #8  $\approx$  30 m west of yesterday's site, just over the S. lip of the main Limestone Ridge. He was under a dense shrub in rocks and leaves, frozen as if he had just struck or crawled out of a coil.

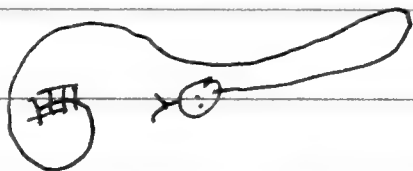




Greene, H.  
1991

August 15  
(continued)

We both think he looks heavy and well fed compared to C. molossus #3. We sat out of sight, then checked #8 at 1025hr, and his head is bent back:



Walking down the mountain we collected a gravid ♀ Urosaurus ornatus as a voucher for the study site. After lunch we processed rattlesnakes and a Pituophis melanoleucus Dave Hardy caught yesterday on the Paradise Rd. ≈ 1 mi. NW of Portal (♂ 1166+175mm, 600g). at 1525hr. we found Crotalus molossus #3 on the E. bank of the same ravine, ≈ 30m W of this AMad across that ravine from where he was at 1730hr on the 13th. The snake was in the open and rattled once as Dave walked up on him. At 1655hr. C. molossus #8 is 3m SE of this AM, coiled under a boulder edge, w/ edge of coil and head pointing out; it is cool and overcast. as we hiked down the mountain I heard a dry rustle and saw a large Sceloporus clarkii descend head-first the dry stalk of an agave. Evening was chilly and there were storms in the distance, but we drove to the State Line and back, catching a Tantilla nigriceps on Portal Rd. and a Trimorphodon between the store and the Hardys' house.

August 16

Early this AM Dave was called about Neil Ford's



Greene, H.

1991

August 16  
(continued)

Copperhead bite. at 0855hr we found Crotalus molossus #3 stretched on the NW bank of the same ravine,  $\approx 30m$  S of the August 13 site. at 0920 hr we released the C. molossus found August 14 at its capture site near Paradise. at  $\approx 0930hr$  Dave and Barney converged from opposite directions on an adult ♂ C. molossus (to be telemetered #9) as it crossed the road  $\approx 100m$  E. of the picnic pullout in our study area. at 1050hr. Kelly and I found C. molossus #8 under the edge of a boulder on a ledge, shaded by agaves, ocotillo, and a juniper tree skeleton,  $\approx 40m$  SW of last night's site (took 3 photos). After lunch we surgically implanted a transmitter in new C. molossus ♂ #9 and processed another adult ♂ found in the yard of Chuck Jensen in Portal this morning. I went to Douglas for dinner w/ Diane Wagner, and saw only 2 C. atrox on Hwy 80.

August 17

Near Scotia Canyon, Huachuca Mts., Cochise Co., Arizona  
We left Portal at  $\approx 0500hr$  and met Fred Wilson, Roger Kopp and Roger's son and friend here  $\approx 0800hr$ . At 0715hr as we topped Montecuna Pass an adult Nasua (rather more yellow than I remember them in Costa Rica) ambled across the dirt road. We are here because Fred says Crotalus willardi are common. The site is  $\approx d. 5700'$  open oak-juniper savanna, the ground fairly open w/ grasses and trees so spaced there isn't a closed canopy except near the canyon bottom near watercourse. It is the first right hand turn up a dirt road after



Greene, H.

1991

August 17 (continued) crossing Scotia Canyon on the road north along W. slopes of the mountains, and we can see the dark green covered steep slopes of the main range to our east. Already warm, sunny, partly cloudy blue sky when we arrive. The canyon bottom has several side washes, and we waded up several on the <sup>south</sup> east, shaded side - Roger reported the other side was already hot and they find Crotalus willardi more active when it's cooler and wet compared to C. Opideus. There are rocks everywhere, even on the rounded gentle ridges between streambeds. at 0830 hr. Dave Hardy spotted a young adult ♀ C. willardi crawling a few meters in front of him over rocks and dead leaves on a WNW facing slope above a side canyon - he fumbled while trying to film w/ a video camera, and later there was good natured joking about him doing cartwheels of joy over finding the snake. When we closed in for capture the snake went under a ~20 cm Ø rock; when grasped w/ forceps she turned and bit, never really struck, and didn't rattle (her strike is only 1 or 2 segments however, so...). at 0915 hr ~~at~~ I suddenly heard rattling at my feet and saw a "large" (relative to expectations) dark rattlesnake in S-coil, backing into a small rock pile - it is a large ♂ C. willardi w/ an obvious food bulge! The snake appears to be in pre-shed condition (it shed in captivity on September 3, the ♀ on September 1). at 1010 hr Roger called from the





Greene, H.  
1991

August 17 (continued) main stream course (dry) to say he'd found another, smaller adult ♂ C. willardi. There are oak leaves everywhere here, and the color pattern of these snakes is indeed difficult to see against them. In the meantime we saw 7 C. lepidus including 4 juveniles, evidently neonates - all in rock rubble; and 2 adult Thamnophis cyrtopsis. We parked near a large stock tank full of bullfrogs, from which extends a large green seepage plane. We left by ~1100hr and went to a swanky cafe in Bisbee to celebrate Kelly's 25th birthday - I took the 2 willardi in w/ me, in a "fanny pack", and we joked about "sir, could you check your ridgenosed rattlers at the door." Back at the Hardys we processed the two snakes under light anesthesia, and I palpated a rodent out that had been swallowed head-first. Because of the big fleshy hind feet I mistook the prey for a Neotoma, but later realized from the tail, forefoot, and skull it is a Thomomys.

Portal, Cochise Co., Arizona

August 18 at 0805hr we released Crotalus molossus #9 off the road near his capture site. At 0815hr we found C. molossus #3, ~80 m NW of where Dave saw him on August 16. The snake was coiled and "dashed" off an open spot into acacia w/out rattling. At 0923hr C. molossus #8 is at the W. end of the main ridge, just before it drops to a shallow saddle & ~150 m NE of the red rock outcrop where he retreated soon after surgery. The snake was in dense shade of shrubs under a



Greene, H.  
1991

August 18  
(continued)

cedar or juniper skeleton, against a low flat rock outcrop; in a tight round coil w/ head in the center. At 1640 hr I found C. molossus #9 50 m NW of the release site beneath the telephone pole outcrop, in dense brush, coiled, rattled as I approached. At 1655 hr I found C. molossus #3 at [<sup>rock cairn?</sup> word illegible!], then 50 m S on the N. edge of the stream channel stretched in dense grass; he rattled when I stepped w/in 2 m, then coiled. After dinner road hunted to Hwy 80, then our study site, then to SWRS.

August 19

at 0900 hr Dave and I caught a Thamnophis cyrtopsis on the road in the center of our study site (E. of the picnic pullout); it thrashed and cloacal discharged when handled. At 0940 hr we found C. molossus #3  $\approx$  15 m SW of the rd. and 75-100 m W. of yesterday's cairn - stretched upslope in clearing w/ head in an S-coil (2 photos). At 1105 hr we found C. molossus #8  $\approx$  20 m N. of the 1st telephone pole - after we walked up to the ridge and back! (This happened because we failed to check the signal walking up...). He is in a tight coil in a cavity at the base of a big Opuntia w/ his head out. At 1230 hr there was a big electrical storm. From 1400-1600 hr we all went to Antelope Pass to help Barney run his arrays of traps, finally quitting because of rain. Barney picked up a fresh DOR Masticophis flagellum on the way back.

August 20

Kelly and I left  $\approx$  0730 hr, stopped in Tucson to pick



Greene, H.  
1991

August 20 up a chain for the Hardys' daughter and to visit the  
(continued) Desert Museum, then made to her grandmother's in  
Santa Barbara by  $\approx 0100$  hr.

August 21 Back to Berkeley.

Portal, Cochise Co., Arizona

September 27 Arrived here  $\approx 1530$  hr, having flown from Berkeley to Tucson  
this AM, then rented a car at the airport. Stopped briefly  
to see Barney Tomberlin, then Sarah Schmidt at the  
U. S. Forest Service station in Cane Creek Canyon. At 1620 hr  
I located Crotalus molossus ♀ #10, SE and across the  
road from "Pole 1" and  $\approx 100$  m NW of "pole 8". She was  
in partial shade of dense acacia, on the sunny side of  
a plant and facing a little clear path, with head  
up and parallel to her tight body coils (as if  
hunting). At 1701 hr I found C. molossus ♂ #9  
3 m E. of Dave's flag from September 21. He is  
extended out from under the base of a dead agave,  
tail still hidden, w/ foreparts in a loose coil  
and an obvious food bulge; head tilted up.

September 28 Indian Creek Canyon, Animas Mtns., Hidalgo Co. New Mexico  
We arrived here  $\approx 0930$  hr (MDST), being Barney Tomberlin, Tony  
Snell, their friends Jeff and Kim, and me. We met up w/ a  
group from New Mexico Game and Fish headed by Charlie Brints.  
They have various snakes caught the last few days, and I  
photographed the redder of two Crotalus willardi obscurus  
(374 + 38 mm, ♀, 55 g). I palped a 6.2 g remnant  
of a juvenile Peromyscus, swallowed head-first, from



Greene, H.  
1991

September 28  
(continued)

a subadult Lampropeltis pyromelana (602 + 111 gms, 87g). From  $\approx$  1030-1730 hr Charlie and Dave Haldeman (Silver City) and I hiked up the canyon, turning back  $\approx$  1430 hr at the top of a steep large talus slide from which Charlie had yesterday taken the C. willardi I photographed and a small adult C. lepidus. Along the way we saw several dozen Sceloporus jarrovi, a few S. virgatus, perhaps a dozen or more scats of Ursus americanus (Tony saw a bear too), and the little pit digging where Merriam's Quail look for buried seeds and tiny tubers. At 1345 hr we found a large adult Crotalus molossus (1020 + 80 mm) sunning at the edge of boulders near the crest of an ENE facing slope, from which I palped an adult Neotoma that had been swallowed head-first. The snake never rattled until I released it. At 1350 hr we found a 50-60 cm total length C. molossus basking next to a boulder; it didn't rattle until pinned, and had no palpable food. As we walked down the creek bottom (water here and there), Charlie found a subadult Lampropeltis pyromelana stretched over a rock in the center of a dry stretch of streambed. It bit, thrashed, & expelled foul cloacal contents when held. Returning to camp we learned 5 other C. molossus and a C. lepidus were seen by others. Barney brought in a large ( $\approx$  1 m total length, 1 1/2 pounds)





Greene, H.

1991

September 28  
(continued)

C. molossus he found coiled and pointing out of a rock crevice behind yellow flowers! I palped a juvenile rock squirrel (Spermophilus variegatus) from it, swallowed head-first (40g remnants, hind foot  $\approx 45$  mm). Both prey items were impressively digested - only hindquarters and full length of the bare spine remaining. We left  $\approx 1830$  hr and had an unpleasant meal in Road Forks.

Portal, Cochise Co., Arizona

September 29

Went to check the first two Crotalus molossus w/ Barney, Tony, Sarah Schmidt, and Christina Schwartz (former SWRS employee). At 0830 hr we found the signal of C. molossus ♂ #9  $\approx 20$  m NE of the Sept. 27 site, under a rock on the south side of the road. At 0845 hr we found C. molossus ♀ #10 at exactly the same site and in the same posture as when I saw her two days ago. At 0905 hr we disturbed C. molossus ♂ #3,  $\approx 150$  m W. of "Pole 1" in low scrub and grass; he has an obvious food bulge, not present when Dave Hardy checked him on Sept. 21. At 1015 hr I returned alone after breakfast to find C. molossus ♂ #9 w/ a food bulge section of coil sticking out from under the boulder in full sun, visible from above when I stood. Went for camera and took photo from above at 1025 hr. Walked around and as I approached from below it



Greene, H.  
1991

September 29  
(continued)

and  $\approx 3$  m distant he slowly w/drew out of sight - now I wonder if he was initially exposed as we clamored up here earlier this AM. At 1135 hr I found C. molossus ♂ #8 at the edge of a peninsular ridge that extends N from the main ridge; he is  $\approx 350$  m N of it, and maybe 650 m NW of the main peak. The snake is in a tight coil against dead branches and a rock, facing an open path between it and a large grass clump - no visible food bulge and in a hunting posture. At 1215 hr I located C. molossus #3 20 m N of this AM site,  $\approx 5$  m down the W. side of the big arroyo that runs N from the road where the pullout is. He is in an open coil under a dead stump and live bush, the food lump on uphill side and in speckled sun. At 1230 hr I found C. molossus #9 w/ his food lump in a hairpin coil w/ head out on top of it, both protruding a few cm out of his hole under the boulder in full sun. From  $\approx 1725$  - 1810 hr I walked around the grassy area just E. of the New Mexico state line where there have been reputed sightings of Sistrurus catenatus. At 1748 hr I spotted a large ( $\approx 15$  cm) Scolopendra (yellow-orange body, black posterior segments) seemingly feeding at the entrance of a Dipodomys spectabilis burrow. The centipede's head was invisible to me, turned into a side tunnel; its body slightly arched anteriorly and very fat. Squirmed when grasped w/ forceps. Barney Tomberlin gave me a neonate Crotalus



Greene, H.

September 29 scutulatus, ~~borned~~ w/  $\approx$  the posterior  $\frac{1}{5}$  of its body  
(continued) missing!

September 30 Today I leave for Tucson, spend the night w/ Billie and Dave Hardy, then fly back to Berkeley in the morning. Today is spectacularly clear - a truly blue sky - w/ light breeze and warm sun. at 0828 hr I located Crotalus molossus ♂ #9's signal coming from under the same boulder as yesterday. At 0839 hr I found C. molossus ♀ #10 in exactly the same site and posture as before. at 0900 hr. I spotted C. molossus #3  $\approx$  3 m up the E. bank of the big arroyo, thus across it and  $\approx$  20 m from yesterday. I had walked w/in 2 m and past, then realized the signal had shifted - he hadn't rattled, but instead was pulling up under the base of a yucca and faced out w/ head and neck in an S-coil. Next I walked around downslope from C. molossus #9 and checked w/ binoculars at 0915, 0930, and 0945 hr but no sign of the snake - the entrance hole is in full sun. at 1005 hr I returned up the arroyo to photograph C. molossus #3 - he is now in an open coil w/ the food bulge out in the sun. At 1020 hr I couldn't see C. molossus #9 from above the boulder.



# H. Greene

1991-1998

## Journal

1992

Arizona: Cochise, Pima Cos.  
Calif: San Bernadino Co.





Breene, H.  
1992

January 11 La Selva Biological Station, Prov. Heredia, Costa Rica



Greene, H.  
1992

March 7 Portal, Cochise Co., Arizona

Drove down w/ David Hardy, arriving  $\approx 0900$  hr, having flown to Tucson from Seattle yesterday. Flying in I could see water shining like mirrors in the afternoon sun down in the washes. Today was beautiful in the Chiricahuas mtns. until late afternoon, when large silver and dark clouds rolled in from the west and we got a little rain  $\approx 1700$  hr. This AM we located 2 of our 4 radiotagged blacktailed rattlesnakes in our study site on Paradise Rd. At  $\approx 1035$  hr we found Crotalus molossus ♂ #9 in a deep arroyo at the east end of the area, perhaps 500 m N of the road. The snake was in a boulder jumble, protected from the wind by the close-in canyon walls, coiled under a ledge it facing SE - most of snake was in shade under edge of rock, but a possible food lump was stuck out in sun (scales visibly stretched for  $\geq 15-20$  cm - see photos). Only response to us was slow sweeping tongue flicks. Shaded air temp. at  $\approx 1$  m was  $\approx 17^{\circ}\text{C}$ , in dirt in sun  $\approx 50$  cm out from the C. molossus was  $\approx 24^{\circ}\text{C}$ . At  $\approx 1130$  hr we found the signal of C. molossus ♂ #3 in the cave where last year I found #6's signal; also could get strong signal at a precise spot on the ground above the cave and 4-5 m back from lip of the overhang. I collected a clean string of snake vertebrae on top the "river" of Neotoma dung.



Greene, H.  
1992

March 7  
(continued)

in the cave. Several carnivore scats on edges of the Neotoma stuff. ~~Fleas~~, not bees, in cave.

San Simon Cienega, Hidalgo Co., New Mexico

We arrived here  $\approx 1430$ h w/ Barney Tomberlin to check out a rattlesnake den in a cottonwood tree!

There is a line of scattered cottonwood groves and we stopped close to the east end at a huge, broken up but still living tree. On the SW side there is a large cavity, filled w/ an apparent Neotoma nest & w/ at least 3 cavities, 1 extending  $\geq 1.5$  m down and out of sight around a turn. Resting in tight coils were two visible Crotalus atrox and a third snake we could scarcely see under the larger of the other two. Total lengths were  $\approx 70$ cm to  $\geq 1.1$  m. After some photographs the snakes abruptly crawled down out of sight, rattling as they disappeared from on top of the chips of the rat nest down into two of the holes. Bright sun, so the wood chips were undoubtedly warm.

San Simon Cienega, Cochise Co., Arizona

We arrived at a sight  $\leq 5$  miles NW of the previous locality, parked at a fence that's on the state line, and climbed into Arizona. This is an earthen dike that extends  $\geq 200$  m out to a spillway, in the midst of the seasonally flooded cienega. The surrounding area is flatland with dense, lush creosote bush the dominant plant. Granite bap dominates one horizon, the Chiricahua another. Around the concrete spillway abutments



Greene, H.

1992

March 7  
(continued)

we found 5 adult Crotalus atrox.





Greene, H.

1992

May 12

Mojave Desert, San Bernardino Co., California

William R. Branch (Port Elizabeth Museum, South Africa), Jonathan B. Joses (my former Ph.D. student), and I drove out of Berkeley  $\approx 1400$  and arrived in Barstow  $\approx 2100$ h. After getting motel rooms we drove to Pisgah Crater and back without seeing any lizards and snakes - rather chilly & almost full moon.

May 13

We spent the morning at Pisgah Lava Flow, mainly around Ken Norris' old shack and study site on the NW edge of the main flow. We saw numerous Callisaurus, Cnemidophorus, and Uta as well as several Sauromalus and Dipsosaurus - and Bill found 4 Phrynosoma platyrhinos, 2 in close proximity. After lunch at the Judlow Cafe, we went to Kelso Dunes and saw several nice big Uma scoparia. On the way back on Kelbaker Rd. we saw several Sceloporus magister on rocks and telephone poles, and caught 3 Xantusia vigilis under Yucca logs. We ate buffalo burgers at the Baghdad Cafe (nee Sidewinder), and talked to an old fellow who matter of factly told us he was a two-star general on active duty, an intelligent officer and State Dept. operative, and a friend of the late Emperor of Ethiopia and some sort of queen of Ghana. Asked me where I was from, then claimed he started the School of Art and Engineering at UCB. Had all teeth on right top missing, a ready grin, and twinkling blue eyes. We road hunted several trips at Pisgah Lava Flow, and found (later released) 2 Crotalus cerastes and 2 Chionactis occipitalis.



Greene, H.  
1992

March 14  
= May

Stopped at Pisgah Lava Flow  $\approx$  0800hr to release & photograph snakes. Noted that the Chionactis, which last night in the dark only squirmed and discharged cloacal contents, now coils, hisses as it strikes violently. Saw 2 nice big Urosaurus graciosa — a  $\sigma$  and  $\text{f}$  on separate creosote bushes, each out on low dead branches basking. We left Jonathan at Pisgah where Phil Bylski will pick him up.  
Water Rd., S. of I-40, San Bernardino Co., California  
Bill and I drove about 2 mi down this dirt power line road on the advice of Claudia Juke, who says the area has a dense Gopherus population — but it is  $\approx$  1100hr and hot, and we see none. We watched a gravid Bambelia defecate while paused in the middle of the road; her head and foreparts were elevated, back bowed down, and tail arched high just posterior to the vent — for this reason we could easily see the bright orange underside of her tail. We walked around to some scattered yuccas and I found a small adult Hypsiglena torquata between the underside of a yucca leaf and its separated bark. We arrived in Tucson  $\approx$  2030hr, after touring the Tucson Mtn. Park and dinner — several Bufo punctatus  $\sigma\sigma$  calling around the Hardys' swimming pool.

March 15

Spent the day at the Arizona-Sonoran Desert Museum and shopping in Tucson.

March 16

Little Scottia Canyon, Huachuca Mtns., Cochise Co., Arizona  
The 3 of us arrived here  $\approx$  0800hr w/ Fred Wilson & Phil Polski to check on 2 radiotagged Crotalus willardi, implanted by



Greene, H.

1992

May 16  
(continued)

Dave & Fred  $\approx$  1 week ago. Sunny and warm, seeming like summer because Arizona has had an unusually high amount of spring rain. At 0840 hr as we searched for a C. willardi in a side ravine, an adult  $\sigma$  Crotalus lepidus rattled continuously from short grass at Dave's feet. I tubed the snake, which felt light and had an empty gut. Soon after, we localized the large  $\sigma$  C. willardi to a spot on a terrace above the ravine bottom,  $\approx$  1 m from a hole next to a small tree. Fred had seen a snake of the same size at this site last year. At 0920 hr we spotted the radiotagged  $\text{f}$  C. willardi coiled in the small rubble of the same ravine; she retreated beneath a small rock as we approached and never rattled. At 0932 as I walked over a ridge to the next ravine I saw a large, bright coppery band Elgaria kingii basking in dappled sun on a Nedoma stick nest built against a log - it retreated into the nest as I approached. At 1006 hr Fred caught a large smelly Thamnophis cyrtopsis basking on boulder rubble at the base of the dam that forms the edge of a large stock pond - the snake felt gravid to me. At 1020 hr as we drove out a subadult ( $\approx$  75 cm) Pituophis melanoleucus appeared stretched, slightly kinked anteriorly, and immobile in the dirt road; it did not hiss or strike.

E. Side of Patagonia Mtns., Santa Cruz Co., Arizona

We arrived here  $\approx$  noon to check out a talus slope



Greene, H.

1992

May 16  
(continued)

above a dry stream bed, open oak woodland, where Fred and Phil saw 3 Crotalus willardi a few weeks ago. As we clamored up the rocks Phil heard a small rattle going out of sight, which we presume was that species because C. lepidus isn't known from here. At  $\approx 1220$  hr Fred spotted a small adult  $\sigma$  C. molossus coiled among the talus slide, only partly visible. We hooked it out, discovered it was in pre-shed condition, and therefore didn't palp or otherwise restrain it.

May 17

<sup>Portals</sup>  
Chiricahua Mtns., Cochise Co., Arizona

Bill Branch, the Hardys, and I arrived here  $\approx 1100$  hr. On the way in, near the E. Whitetail Canyon turnoff on the rd. from San Simon to Paradise, Bill and I checked a yearling Pituophis that was immobile in the dirt road just as described above; it hissed and struck when handled. At 1346 hr we located Crotalus molossus  $\sigma$  #9, appearing rather freshly shed w/ a good sized food bulge, stretch in loose curves in mottled sun under a bush; rattle visible, no visible response to us. At 1415 hr we found C. molossus  $\sigma$  #3 in a tight coil at the mouth of a small hole among rocks,  $\approx \frac{1}{2}$  snake exposed w/ head facing in to the hole - obviously in pre-shed condition. By now a thunderstorm has rolled in, and we get off the slope as light rain starts. Dinner at the SWRS w/ Wade Sherbrooke.





Greene, H.  
1992

May 18

at 0815 hr we found Crotalus molossus #9 ♂, evidently under ground under a bush at the head of a small arroyo,  $\approx 75$  m N of the road and  $\approx 30$  m ESE of yesterday's site. at 0851 hr we found C. molossus ♂ #3 in a loose coil at the entrance of a hole in a small rock bluff, facing into the hole w/ dappled sun hitting him. The snake is  $\approx 1$  m W of yesterday's site and hasn't shed. Before lunch we implanted a transmitter in a Crotalus atrox from near Jeff Gee's house, E. of Portal (♂, 982+82 mm, 700g). at 1600 hr. we located C. molossus #9's signal from a large Neotoma nest 2-3 m S. of this AM's site, and now believe he was there all along. at 1620 hr we found C. molossus #3's signal at the same site as this AM but couldn't see the snake. Tonight Richard G. Zweifel told me this morning he found a Crotalus pricei that had been stepped on, a juvenile w/ hindquarters of a Sceloporus jarrovi in its stomach.

May 19

This AM we helped Barney Tomberlin check his pit fall trap grid in Antelope Pass. Rained off and on much of the afternoon w/ frequent thunder as it has every day here - very unseasonable weather! In the afternoon we released the telemetered C. atrox at its capture site. After dinner we road hunted almost to Animas, finding 3 Scaphiopus couchi and 2 Rhinocenturus lecontei on Hwy 9, and a Gyalopion canum on Hwy 533. The latter thrashed from side to side in semirigid



Greene, H.  
1992

May 19 (continued) half coils, periodically loudly expelling small drops of fluid from its cloaca. Bill Branch suggested that this works on herpetologists - the snake crawls off as they fall to the ground laughing.

May 20 at 0810h Crotalus molossus ♂ #3 was invisible at the same site as yesterday - site is in shade. at 0830h we got C. molossus #9's signal at the same rot nest, snake not visible. Next the Hardys, Bill, Tony Snell, and I went up to sites below Buena Vista Lookout. First we checked the E. facing site where on several years we've found Crotalus pricei and C. molossus (site where the bull strangled). at 1010h we spotted an adult ♂ Crotalus molossus w/ only head and 3-4 cm of neck extended from under a rusty piece of metal  $\approx 1.5 \text{ m}^2$  - same piece <sup>where</sup> we once found a C. pricei w/ a Sceloporus jarrovi in it. I walked over a ridge and north around the top of a steep open hillside where previously I found 2 C. molossus and saw the hung bull. at 1046h. under a  $30 \text{ cm}^2$  rock in a flat pile of rocks facing E., I found a yearling Tamprosettis pyromelana w/ a large food bulge that feels like a Sceloporus. Only response to handling was crawling. In the meantime Tony caught a Crotalus pricei adult under a rock, and several S. jarrovi and S. virgatus. Alternately cloudy and chilly or bright sun. Next we drove to the Barfoot Shale



Greene, H.

1992

May 20  
(continued)

for lunch and walked over the slide - at 1215 hr Bill found <sup>adult</sup> C. piecei w/ opaque eyes tucked under a rock in sun and rattling, in a small patch of shrubs high on the slide. After stopping by the house, Dave and I checked our radiotagged blacktails. at 1415 hr we spotted C. molossus #9 in a resting coil (flat, head down in & tilted up) in dappled sun at the base of the woodrat nest. At 1430 hr we found C. molossus #3 in a tight resting coil at the ~~same~~ rock hole entrance, facing out w/ obvious <sup>milky opacities</sup> blue eyes and still old skin, some sun hitting him. His 13 month old sutures are still visible. at 1450 hr we encountered a small adult ♂(?) crossing the road to the south <0.1 mi NW of the Forest Service cattle guard on our study site. Snake was frozen extended in sun when spotted. as we took photos, it crooked the neck in our direction & tongue-flicked. When grasped w/ a clamp stick it struck a short flashing jab at me - couldn't see if fangs were erect. at 1520 hr we located C. atrox ♂ #1 at 200 m NNW of release site & 200 m W. of the Gee's house. Snake was crawling slowly in straight line in shade of a large bush, but coiled and rattled as we approached to 2 m - it rattled continuously while we took notes etc. An impressive contrast w/ C. molossus.



Greene, H.  
1992

- May 20  
(continued) after dinner we processed the new Crotalus molossus ( $\sigma^7$ , 821 + 60 mm, 343 g, 9 rattle segments including button) and implanted a transmitter (148.450) in him. Then drove over to the Animas Rd. (Hwy 9) and released the Rhinocheilus and Scaphiopus that Bill had photographed.
- May 21 Brief rain  $\approx$  0400 hr. It has rained every afternoon & evening we've been here, sunny and partly cloudy in the mornings — just like summer monsoon season, except not as hot. Supposedly this has been a regular monsoon storm system in climatic terms, and the Hardy's cannot remember a spring here this wet. at 0815 hr. Bill and I located C. molossus #3's signal then saw him coiled  $\approx$  30 cm back in the same hole as yesterday, skin still dark and dull. at 0820 hr Bill found a small Hypsiglena torquata under a dead agave at a point on the road near where at 0830 hr we got C. molossus #9's signal from the same rat nest as yesterday. We released C. molossus #11 downslope from where he was caught yesterday, transmitter keeping. at 0900 hr I walked w/in 2 m of C. atrox #1 and first heard him rattle from underneath an acacia —  $\approx$  50-75 m N of yesterday's site and 150-200 m W of Jeff Gee's house. We packed up, met Barney Tomberlin and Tony Small at the Portal Store for breakfast, and headed for Texas.





Greene, H.  
1992

May 24

Chiricahua Mtns, Portal, Cochise Co., Arizona

Arrived back here  $\approx 1900$  hr, having left Tepos at 0800 hr local time and driven  $\approx 800$  miles. I delivered Bill Branch to Jim Murphy at the Dallas Zoo and picked up an Atheris superciliosa they gave me. Barney Tomberlin says they've had rain and hail everyday here, and it is chilly. He and Tom Sinclair brought me a Pituophis found under a railroad tie at Guadalupe Canyon, from which I palped a Thomomys.

May 25

This AM is chilly at first, partly cloudy. No rain last night. At 0949 hr I saw Crotalus molossus ♂ #9 stretched out and motionless, to the north from out of the rat nest where last seen. At 1000 hr I found C. molossus #3 in an open hairpin coil  $\approx 50$  cm in front of the rock cave where last sighted. His eyes are still blue and skin dull. I took several photos from various angles, but his only response was to flinch each time the flash went off. At 1027 hr I found an adult Masticophis bilineatus active on open ground while searching for C. molossus #11. The whipsnake thrashed, spun, and stuck when I seized it trying to crawl away. I found C. molossus #11 under a  $50 \text{ cm}^2$  boulder on the south side of the road and  $\approx 15$  m NE of the release site. I now realize the latter is  $\approx 300-400$  m west of capture site due to my error. At 1049 hr as I drove in the Hardy's road a youngish looking Geococcyx hopped



Greene, H.

1992

May 25  
(continued)

along in front of my truck carrying an adult ♂ Sceloporus clarkii - the lizard was clearly dead and battered (tongue clamped out of its own jaws) and had a short, barely regenerating tail. Sara Schmidt joined me for afternoon field work and we avoided thunderstorms by timing our visits to particular sites. At  $\approx 1330$  hr we spotted C. molossus #11 up under the same rock as this AM. At 1345 hr we found C. molossus #9 in the same place as this AM, but now in an open hairpin coil w/ head slanted up the inside of a body curve. At 1402 hr C. molossus #3 in light sun  $\approx 1$  m East of this morning's site; as Sara moved closer for a photo he slowly and quietly crawled partly into the rock cave, but seemed reluctant to cease basking - no rattling. Next we drove to the Krong Kander to flip rocks along Kucher Canyon Rd. - soon ran into Kim Murphy the game warden and had a good visit w/ him. Under rocks along the brick road we found numerous Cnemidophorus uniparens, a few Sceloporus undulatus, and one large ♂ Holbrookia maculata. At 1613 hr a subadult Crotalus scutulatus abruptly rattled from the edge of a grass clump from  $\approx 2$  m before we saw it, then crawled slowly off. At 1645 hr I caught a tiny brightly orange banded Senoria semiannulata under a stone - there was a definite under rock



Greene, H.  
1992

May 25  
(continued)

tunnel into which the snake tried to escape. at 1652hr as we drove back up to turn north on Hwy 80 a large ♂ Tenaspene ornata was crossing the dirt road. at 1730hr we localized the signal of Crotalus atrox #1 to a large woodrat nest under a mesquite tree, where Barney also found it on the 23rd.

May 26

Overcast this AM, sun finally poking through at midmorning. at 1019hr I spotted Crotalus molossus #11 still under a rock next to the road. at 1029hr C. molossus #9 is stretched out North from the same woodrat nest, in this posture:



at 1039hr. Crotalus molossus #3 is out on a ledge 4m from the opening of his rock cave, eyes still very blue. at 1058hr. C. molossus #9 is now stretched fully extended from the rat nest, and I watched him continuously from a distance of  $\approx 15$ m across a small gully, from 1059hr - 1116hr. He initially crawled very slowly, evidently mainly w/ rectilinear locomotion. He paused, lowered snout out of side behind a fallen branch ( $\phi \approx 2-3$ cm) in some green leafy vegetation, and I could see rhythmic bilateral jaw movements so assume he was drinking (we had a shower earlier in the AM). After raising his head, the snake turned slowly to the right, so that now the tail and rattle trailed straight toward the nest, perhaps



Greene, H.

1992

May 26,  
(continued)

$\frac{1}{2}$  of his total length was extended straight, and his head rested slanted upward on the inside of an entire loop of the anterior. I took photos, approaching slowly until I was crouched on hands and knees about 50 cm from his face - when he gave a very brief burst of rattle w/ no other movement. Next I picked up Barney Tomberlin and Landon Concagh and at 1150 hr we found Crotalus atrox #1  $\approx 2$  m south of the same rat nest but under the edge of the drooping mesquite limbs - he rattled from  $\approx 1\frac{1}{2}$  km in front of me just as I spotted him. The snake seemed so distinctly more reddish Barney thought it wasn't our radiotagged animal, but we confirmed the signal and spotted green paint at the rattle base. As I drove out of Portal for Tucson, via Paradise, checked on C. molossus #9: now, at 1409 hr, he has pulled the tail into a fairly tight symmetrical coil.

May 27

Barstow, San Bernardino Co., California

arrived here  $\approx 2130$  hr, having left Tucson this AM and had lunch w/ Dave Darall, Bryan Sullivan, and A. Holyeross at ASU-West in Phoenix. I road hunted National Trails Hwy from Ludlow to Newberry Spring and picked up an adult  $\pm$  Phyllorhynchus decurtatus a few miles ~~west~~ of the RR crossing at Pischel Lava Flow - only response to handling was a foul cloacal discharge and squirming.





Greene, H.  
1992

July 29 Tucson, Pima Co., Arizona

Arrived here  $\approx$  1630hr after 8hr drive from Barstow, having left Berkeley at 1400hr yesterday. Heard David Foreman (formerly of "Earth First") speak at a slide show to raise money for "Sky Island Alliance", a group that promotes conservation of southern Arizona mountains. He is a charismatic and well informed speaker, who frequently refers to things and facts from scientists, with credit. Thunderstorm warnings at dusk, rain as we emerged from the talk, and the Hardys' bridge was deep under water - so we drove around through a neighbor's pasture to a connecting yard! Several Scaphiopus calling loudly in roadside ditch.

July 30 W. flank of Huachuca Mtns.,  $\approx$  5700' el., Cochise Co., Arizona

Visited our Crotalus willardi study site w/ Dave Hardy and Fred Wilson. Sunny but not hot, ground moist. at 0940hr we located the signal of Crotalus willardi #3 ♀ under the end of a snail high on the S. bank of the study ravine (Fred has full data). at 0955hr we found C. willardi ♂ #1 - a magnificent big greenish gray animal! - crawling from under a bunch grass clump, pointing toward a nice sized reddish adult coiled  $\approx$  1m away beside another clump. This is exactly where Fred saw him copulate last Saturday, seemingly w/ this red snake. at 1027hr we spooked C. willardi ♀ #2 basking on a hillside; she crawled under the base of a grass clump w/out rattling, and I was very impressed w/ how well her



Hoare, H.

1992

July 30  
(continued)

facial stripes blended w/ the basal dray grayish-white  
grass blades. At 1055h an adult ♂ Elgaria  
kingi by a <sup>grass clump</sup> rock in the ravine bottom. At ~1130h Fred  
heard a rattle and spotted a subadult ♂ C. willardi  
unmarked, the 9th for our study. At 1215h we found  
C. willardi ♂ #1 coiled tightly, partially covering the  
also tightly coiled ♀, both well concealed under the  
edge of the bunch grass she occupied previously.  
Twice she moved slightly (her snout was initially  
under one of his coils), each time he jerkily touched  
her back 1-3 times. Saw Urosaurus and Cnemidophorus  
(sonorae?) on rocks and in oak leaf litter, respectively.  
At 1330h the C. willardi pair were immobile in  
the same grass clump. Earlier we watched him  
crawling (searching for her?), frequent tongue-flicks  
and strange back and forth movements of head  
and neck - not lateral. Fred and Dave have  
seen him and at least one of the ♀♀ do this before,  
suggesting it isn't just used by ♂♂ to search for  
♀♀.

July 30

Chiricahua Mtns., Portal, Cochise Co., Arizona  
Arrived here ~1800h, driving over from the Huachuclas.  
On the drive I was struck by the darkly forested  
(almost brooding) Sierra San José visible just across  
the international border as I drove east toward  
Bisbee. In contrast, Mule Mountain behind  
Bisbee, which Joe Marshall mapped as having



Greene, H.

1992

July 30  
(continued)

encinal (open oak woodland) definitely looks to open and dry for Crotalus willardi.

July 31

Went searching for our radiotagged Crotalus molossus this AM w/ Tony Snell, who last located them. At 0816 hr we found C. molossus ♂ #9 stretch immobile traveling downhill,  $\approx$  150-200m above road and  $\approx$  same distance NE (?) of his last site. At 0821 hr he resumed crawling. At 0844 hr saw a rat active in catclaw and prickly pear as we searched for C. molossus ♀ #12 - found her at 0850 hr in a loose coil (I think we startled her) in thick brush  $\approx$  100 m N of road where Dave tagged her earlier, 50-75 m NW of last site. At 0920 hr C. molossus ♂ #3 is under a boulder at the edge of a large ravine,  $\approx$  35 m WSW of Pole 1. His rattle and tail are extended out, and he tongue-flicked. At 1000 hr we found C. molossus ♂ #8  $\approx$  750 m SW of his last site on the lower slopes of Round Valley, now only  $\approx$  100 m N of the main Finestone Ridge. He was stretched immobile, then crawled slowly and tongue-flicked. This is in dense grass and yucca in a general area he has used before. At 1105 hr we found C. molossus ♂ #11 3 m SW of his July 11 site, in hunking coil perpendicular to a  $\approx$  20 cm diameter runway (photos). Wade Sherbrooke gave me a preserved Nedoma palped from a C. molossus at the Southwestern Research Station earlier this month (HWG-22/2). After dinner I drove to Paradise



Greene, H.

1992

July 31  
(continued)

and back and heard a rattle 1.6 mi W. of Portal at 1905hr - stopped and found a ♂ C. molossus coiled in the roadside drainage gully (6 segments on slightly tapered rattle, incomplete, 877+68mm, 502g, feces collected). He assumed a tightly coiled defensive posture, rattly and crawling backwards, and stunk once when I approached.

August 1

at 0902hr I saw a huge Scelopendra heros crawling slowly w/ lateral turns of the anterior, a few cm from the shade of a prickly pear, on gravel. It is overcast and not especially warm. at 0905hr I spotted C. molossus ♂ #9 stretched over the lowest limb of a small acacia in grass, just east of the same ravine where I saw him in May (but farther N), and far east of yesterday's site. at 0908hr he resumed crawling w/ continuous tongue flicks and frequent head turns over and down into grass clumps. He seems intense! I could hear his rattle "chatter" passively a few times as he moved through vegetation. By 0923hr he had crawled a loop out into the grass east of the gully, then back over the boulder and ~75 cm up into the tree. at 0926hr he crawled ~1 body length down the tree trunk, almost vertically and in a straight path then out into the grass again. at 0952hr I found C. molossus ♀ #12 in a hunched wile at the same site as yesterday, took photo. She faces the



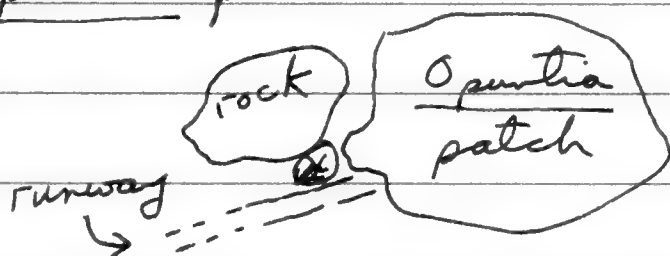


Greene, H.

1992

August 1  
(continued)

runway (down it from one side) from the edge of an Opuntia patch.



at 1021hr I found C. molossus ♂ #3 at the same site as yesterday in a loose coil in sun-shade mosaic under vegetation next to the boulder. at  $\approx$  1045 I squatted across the ravine from where I saw C. molossus #9 earlier today, looked up the gully, and saw an adult ♂ C. molossus coiled tightly under a fallen agaric next to a crevice under a boulder (we later implanted him as #13, ♂ 964 + 78 mm, 687g after regurgitating 2 cf. nestling Neotoma totaling 53g). at 1055hr I found C. molossus #9 now 30-40m east of earlier site on the east edge of a small gully, under a boulder in shade, head facing out, tail sticking out and exposed. Stopped at the U. S. Forest Service Service Visitors' Center, where yesterday a 45.5g ♀ Crotalus pricei (from Barfoot I think) gave birth to 2 dark young (3.6g, 3.9g) plus 2 "slugs." after processing the 2 ♂ C. molossus and releasing the unhandled animal, Dave and I met Barry Torberlin to look for our 2 skinned Crotalus atrox near Jeff Gye (sp?)'s house  $\approx$  2 miles E. of Portal.



Greene, H.  
1992

August 1  
(continued)

at  $\approx 1600$ h we found the big  $\sigma$  C. atrox that Dave raised in captivity, coiled beside a burrow in a mesquite clump. He looks dusty, pre-shed, and skinny. Walking back to the trucks Dave stepped on a dead agave that contained a wasp nest - we were chased, and I got a painful sting through a t-shirt just above my right hip. Tried the Extracto which eased the pain, but it was tender and bothersome and a  $\approx 75$ cm welt all evening. at 1615h Barney spotted an adult  $\phi$  C. atrox stretched straight and immobile in the middle of a sandy wash - didn't rattle until I walked quite close, then quickly bled  $\approx 3$ m up under a small bush, still rattling and in a stilling coil. at 1709h we found C. atrox tucked in a hole under the edge of a big Neotoma stick nest in a mesquite clump - posterior and tail are looped out and exposed to late afternoon sun, and it appears to have eaten (photos).

August 2

Dave and I released Crotalus molossus  $\sigma$  #13 at his capture site and found C. molossus  $\sigma$  #9 a few dozen meters S. of yesterday's resting site under the boulder, both by  $\approx 0815$ h (Dave took notes). at 0855h I spotted the <sup>post</sup> body and tail of C. molossus  $\sigma$  #3 protruding in shade from under the same boulder as last few days. at 1002h. we spotted the yellow back of C. molossus  $\sigma$  #8 in grass, front of hole under a boulder, on top



Greene, H.  
1992

August 2  
(continued)

the ridge level but S. of where he was yesterday (he was crawling this direction then). Moving w/in 3 m we saw he was lying over a ♀ whose tail ran down into the hole — almost immediately he made 3 quick jerks of his snout against her posterior, pointing toward her cloaca. They were in bright sun and it was getting hot. at 1012 hr the ~~male~~ ♂ crawled a few cm into the hole and froze. at 1018 hr he disappeared into the hole, leaving her in an irregular open coil w/ head facing back toward & a few cm in front of its entrance. at 1026 hr the ♀ started to crawl, the ♂'s head and neck emerged immediately, then turned to parallel her neck and they both crawled back toward the entrance. I seized and pulled her out w/ a clamp stick, he rattled and quickly retreated out of site. We took notes and started to leave, at 1038 hr saw the ♂ out in the grass, continuously tongue-flicking, and crawl a  $\approx$  3-5 m circle slowly, turning his snout down occasionally, and always tongue-flicking. (We implanted her this afternoon as #14, freq. 8060, 860+45 mm, 470g, 7 segments, parallel and incomplete). After lunch and the implant surgery, I processed 3 Crotalus molossus Tony Snell and Barney Tomberlin found in Guadalupe Canyon, Peloncillo Mtns., Hidalgo Co., New Mexico. Two were found on July 26th: ♀,



Greene, H.  
1992

August 2  
(continued) 908 + 46 mm, 462 g, 9 segments, barely tapered, incomplete sting; ♂, 888 + 64 mm, 447 g, 10 segments very slightly tapered, incomplete. a large ♂ was found at the same spot on July 30th: 1080 + 80 mm, 1.6 Kg. Tony told me this latter snake was especially prone to strike as blacktails go. Went to SWRS for dinner at George Middendorf's invitation, and Tom Mathies (Virginia Polytechnic) gave me a Lampropeltis pyromelana he found DOR this AM, which has an obvious food bulge (♂ Sedopsis janorii 18g, snake 55.5 g).

August 3 Woke up ≈ 0600 hr to bright sunlight, so left early to release Crotalus molossus ♀ #14. Took me 34 minutes to walk from the pull-out up to the ridge and get C. molossus ♂ #8 <sup>signal</sup> from the same hole where we found him yesterday. Released #14 and urged her down the hole, rattling! at 0815 hr I found C. molossus ♂ #3 in a tight hairpin coil, head and tail not visible, in a crack on the SE side of the boulder where he's been since I arrived. Met Jay Cole and Carole Townsend (AMNH) at the pull-out to go see the others. We found <sup>0903 hr.</sup> C. molossus ♂ #13 where released yesterday, except outstretched in partial sun up-ravine from the fallen agar, his tail visible under the dried plant from down-ravine. As we walked around for a look he retreated under the boulder and out of sight. at 0929 hr we located C. molossus ♂ #9 ≈ 300 m SW of yesterday, just S. of the road under a





Greene, H.  
1992

August 3  
(continued)

ledge at top of big gully, on E. side. He was pulling back under when I spotted him, and rattled very briefly. There is a Nectoma nest under the ledge. at 0944 hr, as we walked E., we saw a huge Scolopendra heros crawling leisurely in shade in the road cut. at 1004 hr we localized the signal of C. molossus #11 ♂ to a hole under a bush  $\approx 50$  m N. of the road and  $\approx 250$  m W. of the Forest Service Boundary. at 1046 hr we found C. molossus ♀ #12 booped into a cavity under Opuntia pads,  $\approx 2$  m from where she was hunting yesterday. after lunch preserved a young ♂ C. molossus found in a shed a week or so ago at the Forest Service Visitor Center.

August 5

Returned around  $\approx 1200$ <sup>1030</sup> hr after overnight at the SSMR meeting in El Paso. Went to Douglas w/ Sarah Schmidt to grocery shop and do laundry. On the way back stopped to see barn owls and pallid bats in the attic of an old house at the Bill Klute ranch. Big electric storms here and there  $\approx 1730$  hr. Early this AM, 1035 hr, an adult Masticophis blineatus zipped off the road into the Hardy's house.

August 6

Started searching for radiotagged blacktails  $\approx 0800$  hr. Vegetation is wet, puddles in road and in holes in rocks everywhere on Limestone Ridge. at 0856 hr I got clear signals from Crotalus molossus ♂ #8 and ♀ #14 from the same hole under rock where I left



Greene, H.

1992

August 6  
(continued)

them on August 3. Sunny and warm. at 0940 hr found C. molossus ♂ #3 in a loose coil w/ head up on one outer coil (i.e., "hurtle" except body coils open rather than compact) in dense grass under an acacia at base of red rocks  $\approx 35$  m N and directly uphill from his last site. at 1002 hr C. molossus ♀ 12 is  $\approx 35$  m uphill (NW) of last site, invisible at base of red rocks below telephone pole. at 1024 hr found C. molossus ♂ #9 signal at the same rat nest as last sight. at 1033 hr I failed to sight C. molossus ♂ #13 at his last site and don't know his frequency for radiolocation. at 1049 hr. I spooked C. molossus ♂ #11, who rattled briefly as he glided from an coil in the open on a hillside  $\approx 1.2$  m into a gopher-site is  $\approx 100$  m NW of last site and on the E. edge of a small gully. From  $\approx 1200$  hr til almost 1400 hr a tremendous rain, lightning, and hail storm - and rained most of the rest of the afternoon. after dinner at the Postal Store Hart Welsh, Amy Lind, and Sarah Schmidt road hunted from Portal to Arimas, then S. until the pavement ends on the Gray Ranch (Nature Conservancy). Rather cool and we no snakes, only lizards (Scaphiopus couchii, S. multiplicatus, Bufo cognatus). In the afternoon I processed a ~~Cratacheilus~~ ♂ Cratacheilus molossus found in front of Findley Russell's house (1080 + 7/mm, 950g, sperm in hemipenes).



Greene, H.

1992

August 7

located the blacktails w/ Dave Hardy, Hart Welsh, & Amy Lind. at 0926 hr we found C. molossus ♀ #14 & C. molossus ♂ #8 lying loosely intertwined in grass at the entrance of the same hole under a boulder as last sighting. Their tails were crossed at the vent but they were not in copulo. Occasionally the ♂ jerkily touched her back and tongue-flicked when she moved. at 09:42 hr they retreated slowly into the hole, her 1st and him blocking the entrance w/ a coil, looking out. at 1045 hr we found C. molossus ♂ #3 in the same site as yesterday, in a tight coil w/ head down in the center - he jerked twice while I watched from 2 m, either because of insects or my presence? At 1120 hr we localized C. molossus ♀ #12 to approximately the same site but could not see her. at 1139 hr we found C. molossus ♂ #9's signal coming from behind the same rat nest under a ledge as before. at 1154 hr we spotted C. molossus ♂ #13 (freq. is 8774) immobile extended as if crawling, under a <sup>2 m tall</sup> ~~juniper~~ tree in shade,  $\geq 300$  m W. of previous site. at 1215 hr we spotted little ♂ #11 in exactly the same spot where I spooked him yesterday - he is in a hunking coil, facing W. after dinner Dave and I road hunted to the Sistrurus site and got a DOR Salvadora early and chased a Crotalus scutulatus off the road at 2111 hr. Bright half moon.



Greene, H.

1992

August 8

At 0828h we found the signals from Crotalus molossus # 8♂ and 14♀ at the same site, a small tuft of grass pushed down over the burrow - by them? Sunny & warm. We waited until 0855h but they hadn't emerged. at 1004h I found C. molossus ♂ #3 on top of a huge Neotoma nest where he had been on June 28th, 500-750m SSW of yesterday's site. at ≈1040h we found C. molossus ♀ 12 under a boulder on a rock ledge in the general area we couldn't see her the last few days - she was in a hairpin coil of 3 equivalent length sections, w/ a food bulge  $\geq \frac{1}{4}$  her body length, i.e., adult Neotoma or larger. By now I was exhausted due to trouble sleeping last night, so Bryan Jennings and Dave did the others. C. molossus ♂ #9 was still invisible behind the rat nest at 1103h. at 1145h after a long walk they found C. molossus ♂ #13 hundreds of meters W. of yesterday, 75m N of the road, 15m E. and 50m SSW of pole #1, coiled under a boulder, looking out, no reaction, in the shade. I went to Rodeo to do laundry, Fogdens arrived, and a great dinner of chiles rellenos. Broke up w/ Kelly by phone and went to bed shook up, then a tremendous thunder storm ≈ 2200h - sometimes such crashes that I imagined the canyon crumbling. I was on a rollaway bed by a picture window facing up canyon, and at times the whole place was so brilliantly illuminated I could see distant geologic details. Heavy rain - 1.8" and 0.2" earlier in the afternoon.





Here, H.

August 9 Went to the study site at 0800h w/ Billie, Dave, and the Fogdens; partly cloudy. at 0822h Dave got C. molossus ♂ #13's signal from under a boulder ~ 5m NNW of yesterday. at 0826h C. molossus ♀ 12 at the same site as yesterday, visible back under the ledge in shade. at 0900h. we found C. molossus ♂ #3 crawling in dense grass & acacia on the edge of large ravine ~ 200m SSE of yesterday, on W. side of the big stream. The other channel of Silver Creek now has 1m high waterfalls, and the main one runs muddy - more water here than I've ever seen. at 0939h we walk up on embankment opposite the ledge where C. molossus ♂ #9 has been, get his signal behind us, and spot him in copulation w/ a large ♀ under the edge of a cecropia plant next to the road! While we watch from a few m away he periodically engages in forward jerks (these are like fast taps) against her back, tongue flicks and occasional tail movements. They face the eastern morning sun, but it is still overcast. at times her tail arches in a "?" shape - his is parallel to the ground and he periodically lifts and lowers it. His right hemipenis is inserted, the basal few mm visible as swollen lavender. at 1017h we saw him push his hemipenis further into her, and at 1031h I clearly saw him use a rather awkward reverse rectilinear locomotion to follow when she moves.



Greene, B.

1992

August 9  
(continued)

at this point I left Dave filming and hiked fast up to the ridge. at 1122hr. I found C. molossus ♂ #8 and ♀ #14 lying side by side in sun at the same site. He is in a hump w/ only head & tail out of burrow; she is fully exposed in a hump of two long segments, and her cloacal region is swollen - I infer they have copulated. As I take photos, he retreats so that only his head is visible, watching me and/or her. Her head is partly under the edge of the adjacent coil and never moves. at 1202hr I'm back at the site of copulation and ♂ ♀ seems to be pulling out or she is pulling off. at 1204hr they separate, we see his still everted and bifurcated hemipenis pull free. at 1207hr his hemipenis is completely retracted and we see what we presume is semen in the grass. When they separated he remained loosely coiled, she crawled slowly around the side of the agave, and I caught her w/out difficulty. We celebrated w/ a picnic lunch at the pull-out. after lunch we processed snakes: our new ♀ C. molossus #15 (freq. 8090), 897 + 52 mm, 635g, 5 segments incomplete and parallel; a ♂ from Cathedral rock and a ♂ from near the Post Office - both regurgitated stomach contents (see catalogue for full data). We also processed two large ♂ C. atrox found last Wednesday (August 5) in combat by Karen Hayes



Greene, H.

1992

August 9, 1280 + 110 mm, 1.81 Kg, 12 segments incomplete and parallel; 1270 + 111 mm, 2.11 Kg, 6 segments incomplete and parallel. We all went to SWRS for dinner, and I picked up a regurgitated stomach contents of a Thamnomphis cystopsis from Tom Mattheis.

August 10 While the Fogdens did photos, Dave and I worked w/ our blacktails. We released C. molossus <sup>at 0854hr</sup> ♀ 15 at her capture site. At 0842 hr we found C. molossus ♂ #9 crawling stretched and fairly fast in sun, disappearing under grass near the bottom of a ravine  $\approx$  50 m N of Silver Creek and 150 m S of the road. At 0942 hr we found the signals of C. molossus ♂ 8 and ♀ 14 in the same hole, and we saw  $\approx$  1/2 of #8's body extending from the hole in a hairpin - head and tail barely visible back in hole. At 1049 hr Dave spotted C. molossus ♂ 3 coiled in a rock retaining wall on the N side of Silver Creek just below the road at the "One Lane Bridge" sign. At 1109 hr we spotted C. molossus ♀ #12 in the same place - in shade, big food bulge still evident, and dirt on her face. At 1136 hr, after a wild goose chase due to confusing signals from the rocky point, we found C. molossus ♂ 13 in shade, tucked up under a rotol plant. He is  $\approx$  40 m W. of Pole 1. and  $\approx$  50 m NW of yesterday, in a resting coil. At 1156 hr we found C. molossus ♀ 15 under a bush in shade



Greene, H.  
~~August~~  
1992

August 10  
(continued)  $\approx 30-40$  m E. of release site, in the next small ravine E. Processed snakes all afternoon, then met Alden and Karen Hays at  $\approx 1800$ h to photograph 2 Crotalus atrox she had found in combat. Her slides and story are that the heavy  $\sigma$  consistently toppled the other. Had dinner w/ them. Alden says the San Bernardino Valley has never been as heavily grazed as the San Simon because there is no running water. We processed a Crotalus molossus  $\sigma$  from Paradise found yesterday at  $\approx 1800$ h (7 segments, incomplete, slightly tapered,  $892 \pm 66$  mm, 520g) and a Masticophis bilineatus whose regurgitated mouse I preserved.

August 11 David has a cold so we skip C. molossus  $\sigma$  #14 up on the ridge. At 0809h I walked right by the young  $\sigma$  C. molossus #11 crawling in dense brush below a limestone ridge - he didn't rattle, looks a little skinny. At 0841h I spotted C. molossus  $\sigma$  #15 in a tight resting coil in shade  $\approx 1$  m S. of the road and  $\approx 10$  m E. of yesterday. At 0855h we found C. molossus  $\sigma$  # ~~8~~  $\geq 500$  m NE of yesterday under the shady W. side of a century plant, counting a  $\sigma$  w/ 8 segments, incomplete. When I first saw them their tails were crossed on the ground, posteriors entwined and anteriors out of sight under the acaia. They jerked tails apart as I moved, but he soon resumed forward jerks and tongue-flick while





Greene, H.  
1992

August 11  
(continued)

lying on top of her, each loosely coiled. at times his tail coiled around hers (it straight) and she periodically shook them both - I could hear their rattles like dry seed pods in wind. at 0917hr she darted in under the agave and he quickly overtook and coiled on her. Dave began videotaping and I left to locate the other snakes. at 0944hr I found C. molossus ♀ <sup>12</sup>14 basking at the same site: photos of her in open hairpin w/ entire side of food lump in ~~shade~~ <sup>sun</sup>, remainder under overhang in shade, same site as before. at 0956hr C. molossus ♂ 13 is in a resting coil under bush in shade  $\approx 50m$  NE of Pole 1 and  $\approx 75m$  from yesterday. at 1015hr I found C. molossus ♂ 3 in the same site as yesterday, in a loose coil in full sun front of rock wall above Silver Creek, head in shade. ~~4m~~  $< .05m$  away a ♀ in coil among rocks facing out. I returned to join Dave, where the ♀ had crawled rapidly several meters W through bushes to edge of ravine, then N to base of juniper tree where at 1052hr I captured her (no rattle). Dave had videotaped the ♂ searching for her w/out picking up a trail. at 1109hr we captured the ♀ next to ♂ 3 (he by then had drawn into shade of the boulders) and she has an obvious food bulge. after lunch we processed & implanted the two new female C. molossus:  
: ♀16 (found w/ C. molossus ♂19) 865 + 49mm, 390g,



Greene, H.

1992

August 11  
(continued)

8 segments incomplete and slightly tapered, no stomach contents, frequency 8011; ♀ 17 (found w/ ♂ #3) 794 + 44 mm, 444 g, 6 segments incomplete and tapered, large meal in stomach (est.  $\geq 75$  g) not palpated, frequency 8568. at 1632 hr (accompanied by Sarah Schmidt and 4 relatives) we found ♀ #15  $\approx 1$  m closer to but still below the road. at 1700 hr we found C. molossus #9 under a large root of the 1st juniper on the edge of the ravine, where ♀ #16 had crawled this AM.

August 12

Heavy overcast, cool. at 0818 hr we ~~found~~ released C. molossus ♀ 16 at her capture site. at 0832 hr we found C. molossus ♂ 3 stretched on the rock retaining wall and released C. molossus ♀ 17 beside him. at 1035 hr we located the signals from the same holes as previously. at 1130 hr we found the signal of C. molossus ♀ 12 at the same boulder, but couldn't see her and I detected a musky smell at the entrance. at 1136 hr C. molossus ♂ 13  $\approx 100$  m SSE of yesterday's site,  $\approx 40$  m N of the road and 60 m S. of Pole 1. at 1159 hr C. molossus ♂ 9 is on the east side of the ravine where I first saw him this month,  $\approx 75$  m N of the road. Dave, Michael Fozden and I road hunted to Bernardino after dinner, and caught live Sistrurus catenatus and Bufo alvarius.

August 13

Overcast and cool, some sun by late AM. At 0815 hr we located the signals of C. molossus ♂ 3 & ♀ 17



Greene, H.

1992

August 13  
(continued)

from under the boulders in front of ( $>1m$ ) where they were yesterday. at 8027hr we saw a Neotoma run (not fast) across the road at the pull-out.

at 0848hr C. molossus ♂13 under a rock and Opuntia patch at the top of a cliff 30m N. Pole 2 and  $\geq 350m$  NW of yesterday's site, in a resting or hunting coil. Met John Groves (Philadelphia Zoo) and his girlfriend, who told us they saw a Nasua in this canyon last week. At 0927hr we found ~~the~~

the signal of C. molossus ♀12 in  $\approx$  same site but couldn't see her. At 0927hr. C. molossus ♀15 was coiled tight in exactly the same place where I spotted her late afternoon of August 12th.

at 0934hr C. molossus ♂9 is  $\approx 100m$  N. of the road, stretched immobile, and rattled when I approached to 1.5m - I had already walked by him once - he is  $\geq 200$

m W of yesterday's site. at 0949hr C. molossus ♀16 is on the W. (opposite) side of her big ravine, emerging from a hole into which she withdrew as I approached to 2m. at 1017hr C. molossus ♂11 is in a hunting/resting coil under the edge of an Opuntia  $\approx 20m$  N. of the road.

August 14

Sunny. at 0810hr the signals of C. molossus ♂17 were at the same site, snakes not visible. at 0817hr

I spotted C. molossus ♀ at the exact site as yesterday.

at 0833hr we found C. molossus ♂9 at the base of rock in a hunting coil. at 0904hr we found the signal of C. molossus ♀12 at the same boulder



Greene, H.

1992

August 14 (continued) as previously, but can't see the snake. At 0935hr we found small ♂ C. molossus 11 in a coil under the same flagged bush where I found him w/ Jay Cole on August 3. At 1005hr we could see ♂ 3 and ♀ 17 ~~on~~ top of the rock wall. At 1042hr we found C. molossus ♂ 1<sup>3</sup> ~~14~~ ≈ 100m N of the road and > 100 m from yesterday's site, in a coil under an herb in rock cavity. At 1108hr Dave and I finally spotted C. molossus ♂ 8 and ♀ 14 in wavy parallel coils, his head on top of hers and both immobile on the W. side of a bush in shade, ≈ 1 m from the boulder where they have been for days. At 1201hr C. molossus ♀ 16 is 20m NNW of her last site, in a tight coil under a large horizontal limb of a big mesquite, no rattling or tongue-flicking. At 1725hr on our way to the Zweifels for dinner, we caught an adult Salvadora grahamiae in the road in late afternoon sun at the top of Silver Creek Canyon.

August 15 Took photos of Dave and I w/ a blacktail for possible use on the dust jacket of the book I'm writing. At 0827hr we located the signals of C. molossus ♂ 3 and ♀ 17 at the same site. At 0848hr we found C. molossus ♀ 15 in a tight coil in shade ≈ 4m ESE of ♂ 9's August 13 site (PM) & ≈ 75m NNE yesterday. 0912hr C. molossus ♂ 11 is crawling slowly through the lower leaves of an agave ≈ 75m N of road & ≥ 200m W. of his last site. At 0934hr C. molossus #16 is 3m





Greene, H.

1992

August 15 N of yesterday's site, in a tight coil under a  
(continued) bush under the same big mesquite. At 1002hr C. molossus ♂9 is in a tight coil w/ tail out, head slightly over outer coil, under a bush at the base of a ledge 30m NNW of Pole 1. At 1013hr we saw C. molossus ♀12 at the entrance of her haunt, snout muddy (dried) - so she is OK! At 1036hr we watched from across the creek channel C. molossus ♂3 and ♀17 at the same site, he immobile in the shade of big bush, tail down in rocks, near where her head and coils are visible down in the rocks. Dave left for Tucson. At 1925hr I was walking from the Portal Store to Sarah Schmidt's house, we were talking about not having a flashlight and how embarrassing for one to be bitten under such conditions, and an adult C. molossus blasted off from the darkness at the side of the road!

August 16 Bright sun, clear sky, hot early. At 0840hr I found signals of C. molossus ♂8 and ♀14 at the same site, but could not see the snakes. At 0919hr the signals of C. molossus ♂3 and ♀17 are at the same site in the rock wall, and I saw her head sticking up from the rubble. At 0942hr I spotted C. molossus ♀12 basking at the entrance of "her" shelter, her food lump smaller but still distinct and exposed to the sun - took photos. At 0955hr I localized the signal of C. molossus ♂9 under a huge red



Greene, H.

1992

August 16  
(continued)

boulder  $\approx 40$  m SW (below) Pole 1, but wouldn't see him even though I drop down into a cleft beside it where the signal was strongest. at 1043hr I found C. molossus ♀ 15 20m N of yesterday's site in a prickly pear/Neotoma nest conglomerate, signal only. at 1053hr I found the signal of C. molossus ♀ 16 in a prickly pear/Neotoma conglomerate  $\approx 15$  m N of the big mesquite where she has been the past few days. I couldn't locate the signal of C. molossus ♂ 13, and didn't try for ♂ 11 because my receiver is out of charge. Returned to find 5 eggs of Diadophis are slit (this started last night, see separate notes); three hatched by late afternoon.

August 17

Two more Diadophis have hatched, total 5; 3 are slit; 1 still unslit. at 0835hr C. molossus ♂ 3 & ♀ 17's signals are in the same place. at 0857hr I found C. molossus ♂ #9 in a tight coil under the base of an alligator juniper on the N. base of Silver Creek, SSE of Pole 1. At 0905hr I spotted C. molossus ♀ #12 at the same overhang, in a different posture, posterior in sun, no obvious food lump (photos). at 0936hr ♀ #15 is crawling slowly through Opuntia in the open and rattled briefly when I passed w/in 1 m; she is  $\approx 40$  m N of yesterday's site. at 0942hr ♂ #13 rattles at me from 2 m at



Greene, H.  
1992

August 17  
(continued)

the edge of Opuntia as he retreats; this is about ~~the~~ 100 m N of the road and 50 m W of his original capture site. at 0950h I found ♀ #16 out of sight under a rock near the last flag (same general vicinity as yesterday). at 1020h C. molossus ♂ #3 is stretched down the bark under the same bush, head out of sight in rocks, near where I can see the coil of presumptive (signal) ♀ #17. at 1030h ♂ #3 pulls head out of the crevice where it was briefly visible against #17's coil. at 1032h ♂ #3 crawls E. into shade of bush and largely out of sight - couldn't see stitches. at 1040h I left. at 1052h C. molossus ♂ #9 is in the same place, but his head extends several cm's out on the ground facing directly out of his coil and shelter. at 1126h. I get the signal of C. atrox #2 at the same spot where it recently shed. at 1134h C. atrox #1 signal is in a hole among large Opuntia on a rocky slope below the radio relay; there is a Neotoma nest at the site, which is WSW of Gee's house and  $\geq 200$  m W of the fence where Dave and I found his signal last (at night). after dinner Sarah and I drove the road and saw nothing.

August 18

Clear and hot by 0730h, gnats worst yet! Neotoma molossus ♂ #9 is hungry! at 0802h I found him in



Greene, H.  
1992

August 18  
(continued)

a small ravine that feeds Silver Creek from the south slope,  $\approx 150$  m S. of the road, SE of Pole 1 &  $\approx 100$  m ESE of yesterday. He is in a perfect hunting coil in dappled sun, on the W. side of the bare channel ( $\approx 40$  m wide) facing across it - waiting for a rabbit? at 0822hr I localized the signals of C. molossus ♂3 & ♀17 at the same site as yesterday. at 0832hr C. molossus ♀12 at the same place as yesterday, in a loose coil (just forming?) - took photo and she slowly retreated. As I drove by Alden Hayes driveway a subadult Masticophis bilineatus shot across the road. Last night Sarah Schmidt (U.S. Forest Service) gave me details of a combat bout between 2 C. molossus, observed by Jany Martinez (Bisbee, also USFS) and another man on July 29, 1992, on a plateau by man-made rock formations above the USFS Visitor Information Center at the mouth of Cave Creek Canyon. The snakes were "big,  $\approx 3$ " in diameter", winding up w/ each other, knocking each other down, hissing, raising 15-18" above the ground beside a "sage bush". The men watched for  $\approx 10$  minutes; the snakes ignored them and were still "dancing" when they left. Sarah and I will leave before noon today for Tucson, so I can give a talk to the local Herp Society.



W

Greene, H.

1992

August 19

Near Scotia Canyon, Huachuca Mtns., Cochise Co., Arizona

We arrived here  $\approx$  0800hr - w/ Sarah Schmidt, Dave Hardy, and Michael Fogden; met up w/ Fred Wilson and his friend Mike Mittelman from Staten Island. Warm & humid, some clouds, evidence of rain earlier today. at 0855hr I grabbed a small adult Salvadora grahamiae crawling in rocks beside the road; it wretched and cloacal discharged, did not bite. Fred and Dave looked for our radiotagged Crotalus willardi while the rest of us searched the opposite (S. facing) slopes of the main canyon. Fred got a new subadult C. willardi in our study area (#10), which Michael used for photos. We went to search rock piles in the main Scotia Canyon, and at 1030hr I got a Crotalus lepidus which I heard then saw crawl beneath one of hundreds in a flat pile - but it went no deeper. Regurgitated a Sceloporus clarki (saved). at  $\approx$  1200hr, while we sat on my tailgate eating lunch, Sarah ~~spotted~~<sup>ied</sup> a ♀ Phrynosoma douglasi in grass at our feet. also saw several Urosaurus and Cnemidophorus, and 2 Thamnophis cyrtopsis. Sarah identified all major trees and shrubs here: Arizona white oak, Emory oak, alligator juniper, Mexican pinyon, squawbush, a manzanita, sotol, cholla, a little "rainbow cactus". No other pines; the site seems to fit



Greene, H.

1992

August 19,  
(continued)

perfectly Joe Marshall's definition of encircl. The others returned to Tucson and Sarah and I returned to Portal around the south end of the Huachuclas, stopping for photos at Montecuma Pass (Colorado National Monument) - especially of the Sierra Madre to the southwest. As we drove through Douglas there was a black wall of storms to the east over the Peloncillos, and we hit the edge of it for a little rain.

August 20

Portal, Chiricahua Mtns., Cochise Co., Arizona  
Bright sunny morning w/ a slight breeze. My right heel ligament is painful to the point I limp - a condition present since before the trip, made worse yesterday by sprinting to move a Terapene off Hwy 80. So I only check 4 blacktails. First went w/ Sarah Schmidt to see her bat diet study site in a mine shaft on Dick & Fran Zweifel's place in Paradise. at 1015h I could see C. molossus ♂ 3 and ♀ 17 in adjacent crevices at the base of the upper rock retaining wall,  $\approx$  3 m W. of where they've been. at 1030h C. molossus ♀ 12 is in a loose coil w/ her posterior  $\frac{1}{4}$  closest to the entrance, all in shade, same site where she has been since at least August 8. at 1047h I spotted C. molossus ♂ 9 in a resting coil in the shade of a juniper, 20 m S. of Silver Creek ESE of Pole 1 and 300-400 m E. of my last sighting of him - probably a brood w/ mating site.



Greene, H.  
1992

August 21

I trudged slowly to the top of Limestone Mtn.,  
heel aching, and fortunately started checking  
signals immediately - located C. molossus ♂ #8  
on a rock shelf on one edge of a Sotol-sized grass  
clump,  $\approx 75$  m W. of previous site and facing NE  
from the N side of the ridge. He was in an open  
coil, head on rock, and looked suckered! I  
touched him gently w/ a stick and he flinched  
C. molossus ♀ #13 signal comes from the same  
big grass clump, so they have changed sites  
together. At 1020 hr C. molossus ♀ 17 is pulling  
her tail into the same crevice as yesterday - due  
to my arrival so close? No signal there for ♂ 3.  
At 1035 hr I found C. molossus ♂ #3  $\approx 200$  m N of  
that site, under the N. edge of a juniper in  
deep shade, in a hunting coil facing the trunk from  
the tree's edge - he is  $\approx 500-750$  m due W. of Pole 1  
on the first ridge NE of the N. branch of Silver Creek  
and NE of the big ridge that parallels the road. At  
1100 hr I found the signal of C. molossus ♀ #12  
under a rock under a large bush (Rhus choriophylla)  
associated w/ Nestora nest,  $\approx 20$  m SE of last  
site and  $\approx 40$  m SE Pole 1. Barney gave me a  
♀ Sceloporus clarki he caught in Portal that  
died of heat in his truck. Went to Agua Prieta  
(Sonora, Mexico) for dinner w/ Sarah Schmidt and  
Wade Sherbrooke. As we passed through the



Greene, H.  
1992

August 21  
(continued) Kieritz Ranch  $\approx 18:30$  hr we saw two herds of Antilocapra south of Hwy 80, each a group of females accompanied by a big male.

August 22 at 0845 hr I found C. molossus ♀ #17 50 m W on the same rock retaining wall, by a culvert pipe 2 m below (S. of) the road. Note an old shed skin nearby. Today is overcast and humid. At 0910 hr C. molossus ♂ #3 rattles and assumes a high coil at me from  $< 2$  m away on the opposite side of a bush - he is out crawling  $\approx 75$  m NNW of yesterday's site and  $\approx 10$  m W of the mine road, due W. of Pole 1. At 0934 hr I localized C. molossus ♀ #12's signal to 2 m above and S. of her previous long-term basking site. At 0951 hr C. molossus ♂ #9 is in a hunking coil in the open, on the edge of a ravine on S. side of Silver Creek, 30 m E. of yesterday. At 1021 hr C. molossus ♀ #16 is in a small steep gully below & between the right and center "dolphin heads"  $\approx 150$  m N of the road and  $\leq 50$  m from her last site, in a resting coil tucked under a boulder. At 1045 hr I saw C. molossus ♂ #13 crawling into a packrat nest under an Opuntia  $\approx 75$  m NNW of the road on the E. edge of a ravine that ends near the W. edge of the main limestone ledge system - and he puts his head out as if investigating me as I approach, which causes me to ponder if he's hot on the trail of a ♀. At





Greene, H.

1992

August 22 1050hr he emerges out the N. side of the prickly pears  
(Continued) tongue flicking and swinging his head side to side,  
rattles and comes a few cm toward me when I  
moved, then resumed "searching." at 1131hr I  
returned to this site searching for C. molossus ♀ #15  
(stupidly I didn't check for her signal earlier!)  
and found her under a boulder edge of ravine w/S.  
molossus ♂ #13, ~4 m NW of his earlier location, and  
saw him making "forward jerks." at 1154hr I  
localized C. molossus ♂ #11 to a large sumac  
clump over boulders below rimrock of the S.  
curving ridge that is the E. boundary of our  
"main" study area, ~100 m N. of the road. after  
lunch I processed 2 Crotalus molossus caught  
for me at SWRS: ♀, 901 + 42 mm, 503g, 9  
segments, parallel, incomplete; ♂ 946 + 70 mm,  
503 g, 8 segments, parallel, incomplete.

August 23 Today is chilly and humid, w/a solid cloud bank  
down to ~7000' <sup>on</sup> and the ridge tops - feels like winter,  
but not cold. at 1025hr Dave and I found C. molossus  
♂ #8 alone in a hole under a boulder on the S. side  
of Firestone Mtn. ridgetop, ~75 m WSW of yesterday  
- he was in a loose coil, head not visible. at 1032hr  
we found C. molossus ♀ 14 under a group of ~4  
clumped sotol, invisible, ~75 m E of ♂ #8 and  
~5 of yesterday, on the S. edge of the ridge. at  
1122 hr. C. molossus ♂ #3 is ~100 m W. of



Greene, H.  
1992

August 23  
(continued)

yesterday, crawling slowly, turning head side to side, tongue flicking, in low brush on the low plateau. At 1150 hr we found C. molossus ♀ #17 in a tight hairpin coil against the rock wall base in grass at the same site as yesterday. At 1217 hr C. molossus ♀ #12 is  $\leq 50$  m N of former site, out of sight in a hole. At this point, viewing our study site, the main plants are juniper, sotol, agave, sumac, acacia, ocotillo, and prickly pear. Next came a frustrating but ultimately successful search, because we were rapidly running out of receiver power—signal going up and down in volume, losing then regaining directionality. At 1248 hr we found C. molossus ♂ #13 & ♀ #15 together to 30-50 m NE of yesterday's site, in a loose coil w/ ♂ over ♀, tails not joined. He alternated bouts of Forward Jerks and Tail Searches w/ quiet, captured on video by Dave. At 1258 hr she whipped her tail so strongly that I could hear her rattles against vegetation from 4 m away. They paused, he resumes FJ's at 1301 hr. Afternoon spent packing, then dinner at the store w/ Sarah, Hardy, Barney, & Tony.

August 24

Left Portal, lunch w/ herp crew from Desert Museum in Tucson, then a 2-hour visit w/ Beth Gibson in Sedona. Drove to Kingman for night in a motel, to Berkeley mānana.



Greene, H.

1992

September 13

Chiricahua Mtns., Portal, Cochise Co., Arizona

arrived here evening of the 11th and am just now getting out to look for the radiotagged Crotalus molossus.

I flew down from Berkeley, on the downhill side of a bad cold, and spent most of yesterday napping. The plan was to meet Sarah Schmidt for dinner then hurry up to SWRS on Friday night for a talk about bears to be given by local game warden Kim Murphy.  $\approx 10$  miles N of Portal on the San Simon Rd. I stopped to nudge a  $\approx 1$  m Crotalus atrox off the road, then couldn't get the rental car out of "Park" (automatic transmission). Contemplating a  $\approx 2$  hr walk in the dark (it was  $\approx 1815$  hr, sun fading), I discovered my flashlight locked in my suitcase because I left my key chain at the security check at Oakland Airport. Finally discovered a "secret" release button behind the transmission hub and drove in, on time, etc. Now I'm having trouble finding signals because of old faulty connector cable to the receiver antenna. at 0930 hr I found C. molossus ♂ #3 crawling and tongue flicking a Plestion nest surrounding the base of a 2 m diameter boulder, in a small gully  $\approx 150$  m W. of Pole 2 and due W. of the cave used in past as hibernaculum. He rattled very briefly when I approached to w/in 1 m. at 1004 hr I found C. molossus ♀ #17 disappearing into a hole that faces east from the



Greene, H.

1992

September 13 (continued) edge of a Neotoma nest in dense yellow flowers, at the edge of a small gully where several gullies meet  $\approx 50-75$  m N. of the road and 150-200 m W of Pole #1. Forgot to mention that last night before sunset Sarah and I hiked to Crystal Cave (between SWRS and Herb Martyr Dam) for a picnic dinner - spectacular views of canyon walls, full moon.

September 14 Rain started before dawn and drizzled all AM and into the afternoon - I took it easy, still recovering from bronchitis and having asthma.

September 15 Richard Berman, Sarah, and I saw a  $\approx 1$  m Masticophis bilineatus dash across the road into Spoffords and Hardys at 0924 hr. at 1026 hr we found Crotalus molossus ♂ #13 in a resting coil under an acacia, no response to us, rattle exposed, below the third "dolphin head" and just above the main gray limestone rimrock. at 1108 hr we found C. molossus ♀ #16 in a tight resting/hunting coil, tight against the base of an ocotillo,  $\approx 30$  m W of #13's capture site arroyo and S. of the second "dolphin head." at 1207 hr we found C. molossus ♂ #11 on top of a limestone ridge SW of the canyon that crosses our road at the USFS boundary, N. of the road, in a tight coil under prickly pear in very dense acacia. Talked to the Spoffords, who said they haven't observed any snakes feeding; Walter





Greene, H.

1992

September 15 (continued) saw a very small blacktail recently, in grass near a corral. They knew the Wrights at Cornell U., and said Albert's lectures were totally disorganized, that he constantly inserted "Now, ..." in his sentences.

September 16 at 0858 hr in bright sun a large Scelopendra heros moved rapidly across Paradise Rd. in front of me in our study area. At 0920 hr I found Crotalus molossus ♂ #9 in a tight coil in the shade of a 3 m shrub, on the E. flood terrace of the Forest Service boundary canyon, just below where the 3 canyon drainages meet,  $\approx 200-300$  m N of the road. at 0933 hr I spotted C. molossus ♂ #11 crawling slowly and tongue-flicking,  $\approx 4$  m SW of yesterday's site. From  $\approx 10:10-10:35$  hr I searched both sides of Limestone Ridge but could get no signal for C. molossus ♂ #8. at 1055 hr I localized the signal of C. molossus ♀ #14 to a hole w/ Neotoma nest in the main gray limestone outcrop near its W. end, perpendicular to and  $\approx 150-200$  m N of the road. at 1132 hr I found C. molossus ♀ #12 in a resting coil under a flat above the ground Opuntia pad - very hard to see - at the base of an acacia, at the base and W. end of the red rocks ridge &  $\approx$  perpendicular to the main road bend. In mid afternoon Sarah Schmidt and I went to upper East Whitetail Canyon to check out some old mine shafts for bats - she entered two while I puttered outside. Upper slopes cloaked in dark green, but still lots of ocotillo and century plants - and on the ground the sublimely beautiful



Greene, H.  
1992

September 16  
(continued)

smokey blue green agaves. At the first shaft we suddenly encountered a wash of cool, clammy air when we dropped into the vegetated trench above the tailings, and the smell of guano. During back in late afternoon sun, we found a juvenile Thamnophis cyrtopsis<sup>1702hr</sup> (cloacal discharge & thrash, no biting) and a neonate Pituophis melanoleucus (1709hr) (tail vibrate, hiss, strikes) basking on the dirt road. At 1806hr, after I walked us  $\approx 1$  km through brush, we found C. molossus ♀ #15  $\approx 20$  m S of the road and  $\geq 100$  m E of the large road to the S & on the SW edge of the curve at the E. boundary of our main study area - she was crawling near the base of a juniper on open ground, and rattled at me briefly then coiled as we approached to  $\approx 2$  m w/out first seeing her.

September 17

Drove to Tucson and returned to Berkeley. Barney Torberlin gave me a Masticophis flagellum from Douglas, which showed up on the airport security x-ray in my jacket - fortunately, the American West supervisor let me on anyway!

September 21

Sarah Schmidt told me by phone that at  $\approx 1930$ hr tonight, after dark, she saw 2 Urocyon cross the road in our study area - another potential predator on Crotalus molossus.



Greene, H.  
1992

October 10

Chiricahua Mtns., Portal, Cochise Co., Arizona  
arrived here last night in time for dinner, having  
driven from the Tucson airport w/ Mike Lipske, a writer  
for National Wildlife magazine. From 0900-1300 hr we  
walked over the blacktail study site and located four  
snakes. (Dave Hardy has the detailed notes). I photographed  
C. molossus #13 under an Opuntia pad & C. molossus  
#11 basking from under the edge of a small boulder at  
roadside, foodbulge in the sun. Saw a large  
Sceloporus clarki active on a ravine wall. at  
1540 hr and  $\approx$  1800 hr I spotted C. molossus #11 still  
out basking. at 1900 hr he was no longer visible,  
and I placed thermocouple leads from a Bailey  
Bat thermometer in deep enough to measure shade  
and in soil  $\approx$  20 cm out from the entrance to  
measure sun temperatures. as Sarah Schmidt  
and I drove down the Paradise Rd. toward Portal,  
on the east end of the study site, at 1910 hr we  
watched seven Tayassu tajacu cross the road:  
an adult, two young, an adult, two young,  
and finally a smallish adult w/ dorsal ruff  
up.

October 11

Clear blue sky & warm, as yesterday. at 0850 hr  
C. molossus #11 was not visible, temperatures  
18.3 C in shade, 19.8 C in sun. at 1043 hr I  
saw an active Spermophilus variegatus [and at  
least twice later this trip, Eutamias]. at 1130 hr



Greene, H.

1992

October 11  
(continued)

C. molossus #11 had his coil in sun, shade 25.5 C, sun 44.1 C, head not visible. From 1130 - 1400 hr Dave Hardy, Mike Lipske, and I hiked to the upper east side of Forest Service boundary canyon to locate & photograph C. molossus #9 in a hunting coil perpendicular to a small steep ravine, then moved around the upper canyon to find C. molossus #15 barely visible under a small boulder on the east facing west rim - an exhilarating hike! At 1415 hr C. molossus #11 was barely visible deep in the shade of his cave, shade 31.7 C, sun 40.2 C. The site is amazingly dry compared to my last visit, when everything seem lush and in full flower. Now the yellow flowers are pale, like dry paper, and my boots crunch rather than swish as we walk through vegetation. It is very dusty, and the dust is as fine as talc. After a late lunch at the store, I talked w/ Helen Snyder who lives here and studies goshawks. She said ~ August 1 Ray Mendez picked up a big ♂ Elaphe triaspis, that she saw a DOR E. triaspis that contained a Peromyscus and that Barney Tomberlin knows about this, and that she found a Lanropeltis pyromelana in a can containing a mouse nest in her outhouse. At 1545 hr C. molossus #11's head was extended out from the inner cave to the





Greene, H.

1992

October 11  
(continued) entrance, shade 30.4 C, sun 38.0 C. at 1834h  
he was coiled at the entrance, shade 24.4 C, sun  
25.0 C (this was after sunset). Sarah Schmidt  
and I had dinner w/ Fran and Dick Zweifel  
in Paradise along w/ their houseguests, Ernest  
Karlstrom (former MVZ student of Stebbins) and  
his wife. At 2140h C. molossus #11 was out  
of sight, shade 19.4 C, "sun" 17.9 C (dark).

October 12



H. Greene  
1991-1998

Journal

1993

Arizona: Cochise Co.



Greene, H.

1993

July 24

Little Scotia Canyon, Huachuca Mtns., Cochise Co., Arizona  
arrived here  $\approx$  1400hr w/ Fred Wilson - I drove from Berkeley, picked Kelly Zamudio up at the Tucson airport yesterday afternoon. Warm, no recent rain but lots of green grass and insects. We located Crotalus willardi ♂ #8 tucked under bunch grass on the W. wall of the main canyon, face visible. Then C. willardi ♀ #15 under the edge of a rock in a ravine (the 5th from our "study" ravine), only edge of her body showing. At 1425hr Kelly grabbed an adult Sonora semiannulata wriggling across rocks in the sun. Later I palpated two small spiders w/ egg cases out of its stomach. At 1440hr Kelly and Fred saw a small Salvadora in the brush pile where we found a C. lepidus w/ food lump on a previous trip. We found C. willardi ♂ #16 & ♀ #17 together in a bunch grass clump, and ♀ #14 stretched out in shade among rocks - when we approached to  $\approx$  3m she crawled slowly  $\approx$  2m & investigated a rock cave, then froze; we left. Fred told me has repeatedly seen C. lepidus turn to face pursuer as their tail disappears under a rock - thus people get stuck reaching in w/ forgs. We saw a ♀ Holbrookia maculata in the ravine bottom (she ran fast several meters - surprised me as I'm used to this species being more sedentary) and heard bullfrogs calling from



Green, H.  
1993

July 24  
(continued)

the pond at the head of this canyon. We set up our tent near there. Beautiful peaceful dusk, various birds & occasional bullfrogs calling, nightbirds flying by. Big sliver of a moon, lots of stars, thinking about Joe T. Marshall camping in these mountains four decades ago - he would have known all the nocturnal bird noises. We were awakened early next morning (20500h) by a very noisy raven conversation, and earlier I heard an animal tumble cobbles on the slope  $\approx 30$  m away. Maybe a deer - there are lots of droppings here and a small adult's carcass near the dry stream crossing just below camp - chest and forelimbs all eaten away so perhaps a lion kill (seems too big for a bobcat to have done it).

July 25

Cloudless blue sky at 0730h, after breakfast. My altimeter reads  $\approx 1595-1620$  m in the floor of Little Scotia Canyon near our campsite, but I haven't calibrated it since leaving Berkeley. Fred Wilson & Phil Pugliesi (his brother in law) arrived from Tucson  $\approx 0745$ h and we set out to check the snakes (Fred to detailed notes). All of the C. willardi are in the same places, except that C. willardi ♀ #14 (gravid) is back under a red rock she has used in the past. No one is basking - e.g., C. willardi ♀ #15 is several cm back in her crevice, head looking out. In our main study canyon Fred spotted an adult ♂ C. lepidus, and Phil a smaller one near C. willardi ♂ #8 - w/in 10 m. They left after lunch. Kelly saw





Greene, H.

1993

July 25  
(continued)

Urosaurus ornatus, Holbrookia maculata, Cnemidophorus, and a ♀ Sceloporus scalaris in bunch grass - she also saw S. darwini. Fred & Phil left after lunch, taking the new gravid ♀ C. willardi we found this AM. Kelly walked down main canyon bottom, roosed 2 Cnemidophorus snorae and found a young ♀ C. lepidus which we processed (see David Hardy's C. willardi study site notebook). In the mid-afternoon I located all 5 telemetered C. willardi back in their shelters - gravid ♀♀ #14 & 15 under rocks, pair #16 & 17 under same bunch grass, and ♂ #8 under bunch grass. Took photos of 14 & 15. I found a neonate Phrynosoma douglasi active in the middle of the road.

July 26

a warm cloudless morning. Sometime last night, before midnight, I heard again something disturbing cobbles on a nearby slope - then a bird squawking from the same direction for a couple of minutes. at 0740 hr I found C. willardi ♂ #8 in exact same place & posture - I now doubt that he has moved in the two days we've been here - on sunny east facing canyon wall. at 0750 hr I spotted C. willardi ♀ #15 under a rock on the left side of little gully on the <sup>west facing</sup> east canyon wall, x1 m from the rock facing down gully where she was yesterday - photos of her head & posterior body coil facing out in edge of sunlight. at 0820 hr. C. willardi ♂ #16 & ♀ #17 under same bunch grass



Greene, H.

1993

July 26  
(continued)

clump; I could see a coil and small head (♀?), all in shade. at 0830 hr. C. willardi ♀ #14 is  $\approx$  2 m uphill from the red rock where she was yesterday, under cleft of small rock, in shade, head face out. Walking back and checking stick piles, I wonder if C. lepidus hang out there because of the likelihood of ambushing scelopore lizards. at 0900 hr I checked out the rock piles below the earthen dam where we are camped and found an emaciated Thamnophis cyrtopsis basking stretched out, w/ its entire tail gone and the stump necrotic (based on smell). It could crawl reasonably fast tho not as rapidly as other adults I've caught here. No postloacal musk odor from handling. at 1020 hr I grabbed an adult ♂ (245 <sup>+55</sup> mm, no food in stomach) Sonora semianulata as it dashed at my feet in rocks and oak leaves - in sun but near shade. The orange and black bands are very obvious and disorienting when the snake crawls rapidly. It took refuge under a rock w/in 0.5 m where we caught it - squirmed when handled. at 1030 hr C. willardi ♀ #15 is in the same place, but now under downhill edge of rock in shade. She was facing out but when I came close for a photo attempt she pulled her head out of sight. at 1055 hr C. willardi ♂ #16 and ♀ #17 are as before, the small head easily visible facing out. at 1100 hr C. willardi ♀ #14 is in same place. a few white



Greene, H.  
1993

July 26  
(continued)

clouds to the west. It is dry now: we have seen Cnemidophorus, Urosaurus, Holbrookia, Phrynosoma, and two species of Sceloporus - but not Eumeces callicephalus and Elgaria kingi. The telemetered Crotalus willardi are simply not moving. The spillway streambed is dry, only a single deep mud hole still darker color from the last time it held water (there are small tracks through it, I think Nasua - Kelly saw a glimpse of a long-tailed cat-size animal soon after we arrived that I suspect also was a coati). There are a few (~~6~~ 6) calling Rana catesbeiana around the big stock tank, and  $\geq 1$  in the overflow "swamp" below it - surprisingly few given how many (hundreds) of immatures bullfrogs we saw here two years ago. It is distinctly hotter today and I'm so sure the willardi haven't moved that I won't radiolocate them again.  $\approx 1600$  hr Kelly and I walked down canyon looking for Phrynosoma and released the ♂ Sonora from this AM at its capture site. At 1630 hr I spotted C. willardi ♀ #15 under the same rock as this AM, head not visible, in shade. We hiked up the west canyon wall and then north, checking out side canyons. At ~~17~~ 1715 hr we were walking a game trail that cuts across the top of side canyons and as I approached an old dead snag near a rock jumble at the head of the second draw south of our campsite, I



Greene, H.

1993

July 26  
(continued)

said "I have it on good authority that this is great microhabitat for ... [C. lepidus]" when I was interrupted by rattling and spotted an adult ♀ (≈20" TL, possibly gravid) C. lepidus crawling under a rock in the jumble - lifted it and she was coiled facing out. She had basal + 6 segments, parallel and incomplete. I recorded her blotch code (in D.L. Hardy notebook for this site) and paint marked her. Back at camp we splashed ourselves w/ water, danced around naked, and split a Chihuahua beer. Cicadas in a nearby juniper tree, flies, butterflies going by.

July 27

Another warm, clear morning - except still some white wispy clouds to the southwest. Over coffee the jays are yacking and flying back and forth across the canyon, and a low buzzing drone of flies is almost constant. Occasionally a single bullfrog calls. Last night I heard gentle rustling in the dry oak leaves ≈30m SW of our tent and first thought it deer (a large antlerless one came through the swamp pond yesterday afternoon while we puttered in camp). After a few minutes I could distinguish two sources several meters apart and heard several jaw chomps. Looking out our back flap I saw two dark shapes emerge from the moon shadows of a small oak ≈15m away, and woke Kelly. W/ flashlight we saw

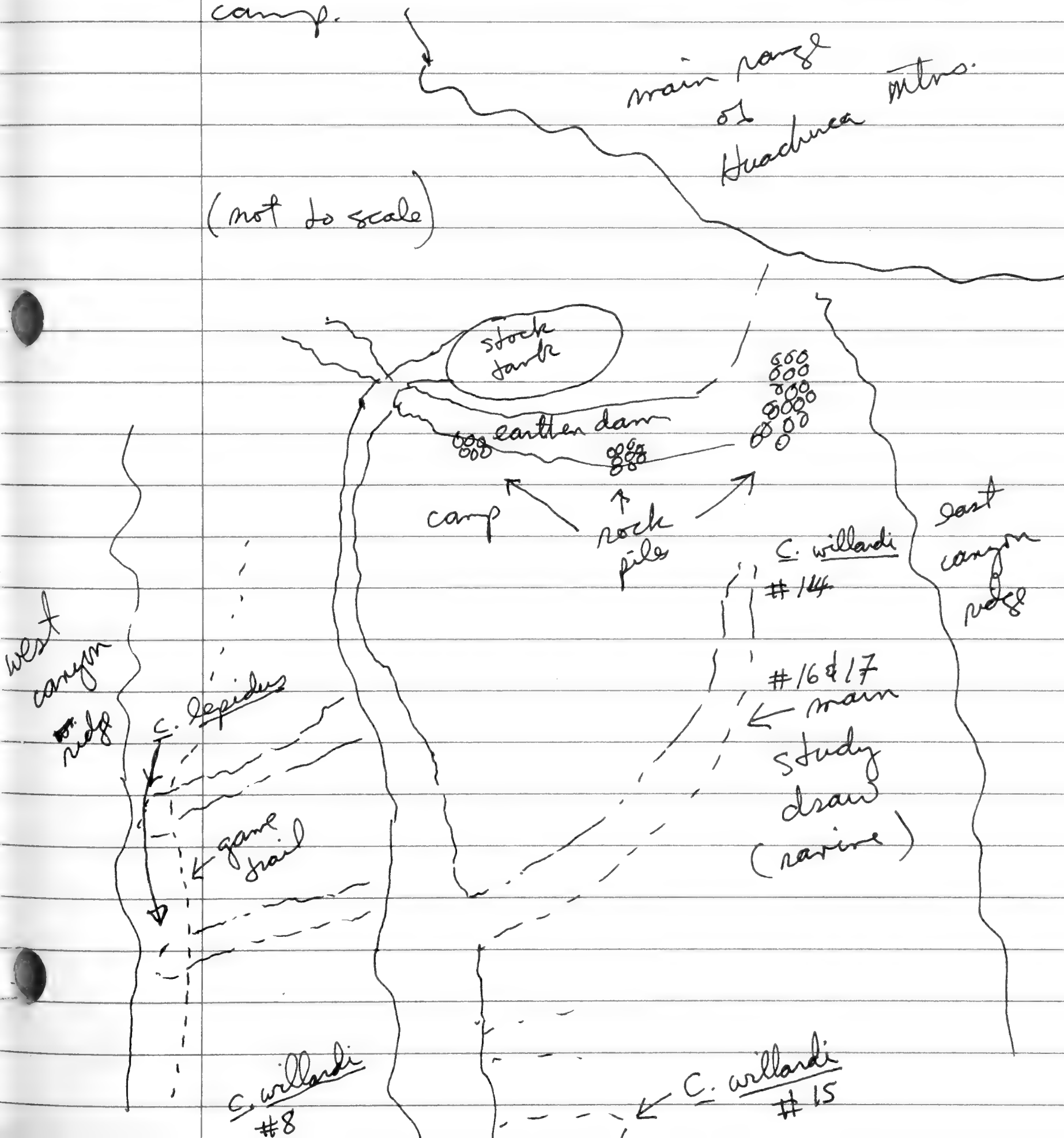




Greene, H.

1993

July 27 two javelinas (Tayassu tajacu), one distinctly (continued) larger. They seemed shy of the flashlight beam and moved away a few meters, but we could hear their rustlings for several minutes as they moved back toward the arroyo that runs west of camp.





Greene, H.  
1993

July 27  
(continued)

at 0805hr we found Crotalus willardi ♂ #8 under the same clump of bunch grass, which is in sun, his head facing out. at 0815hr I found C. willardi ♀ #15 under the downslope facing rock where we first spotted her this trip - a coil barely visible, couldn't see her head; in shade. at 0855hr found C. willardi ♂ #16 and ♀ #17 signals from same bunch grass as before and could see edge of one body coil; in shade. at 0905hr C. willardi ♀ #14 is under same small rock as yesterday, but can only see edge of body, not head; in shade. Walking on the east canyon slopes Kelly found another neonate Phrynosoma douglasi (she needs them for her DNA analysis of intraspecific phylogeny) and she hand caught a gravid Holbrookia maculata. at 1050hr (w/out telemetry gear) I spotted C. willardi ♀ #15 in the same crack, 6-8 cm from the entrance, her posterior body coil and head facing out; she is in shade, her rock in sun. at 1105hr I saw a coil where C. willardi ♂ #16 & ♀ #17 were radiolocated this AM; their grassclump is in hot sun but they are shaded. at 1110hr I spotted C. willardi ♀ #14 in the same place, her rock slide in sun. Her head and a swollen posterior body coil are in shade just inside the entrance to the crevice. I am impressed by how inconspicuous are these gravid females. We broke camp after lunch and returned to Tucson, from where Kelly will fly to Seattle tomorrow.

July 29 Arrived back at Little Section Canyon at 0840hr - sunny, obviously hasn't rained since we left. at 0850hr I



Greene, H.

1993

July 29  
(continued)

released C. willardi ♀ #18 at her exact capture site and she coiled under the rock facing out. at 0855 I checked the spots where C. willardi ♂ #16 & ♀ #17 were and could see coils of two snakes and a relatively large head looking out. at 0857h C. willardi ♀ #14 glides in the grass w/out rattling from a grass clump ~ 50 m from her hole under the rock and disappears into it. at 0907h I spotted presumptive C. willardi ♂ #8 ~ 5 m below his last site - at base of the rock slide in sun-shade mosaic. I actually heard him in the grass then saw him glide w/out rattling, continued slow crawl w/ tongue flicks and a few ant-post. head jerks. Photographed his pattern, including yellow paint dots on head & rattle. He has a recent & fairly large food bulge. at 0920h I failed to spot C. willardi ♀ #15 at either of the crevices where she was earlier telethetically located (I don't have the equipment w/ me now). Next spent ~ 30 minutes in Scotia Canyon, walked to the large rock piles, then back by way of wooded opposite side of creek. at 0940 a juvenile Crotalus Opidus rattled as it escaped into oak leaves at the base of a tree - heard then saw it. There were many dead branches nearby, in shade. Driving south to go over Montezuma Pass I



Greene, H.  
1993

July 29  
(continued)

failed to catch a large Crotaphytus collaris in rocks; in the course of searching for it, saw a Peromyscus and its grass cup nest under a small rock.

July 30

Portal, Cochise Co., Arizona

Arrived here yesterday PM from the Huachuclas. at 0910 hr (after 40 minutes of searching!) I found Crotalus molossus ♀ #12 under a large rock on the 1st high knave south of Silver Creek & roughly opposite Pole #1. She was in shade  $\approx 30$  cm back, facing out, rattle not visible, no food lump or other snake visible. at <sup>09</sup>0938 hr I spotted C. molossus ♂ #3 crawling up a  $\approx 45^\circ$  slope in the open sun at  $\approx 2-3$  m minulte, at least some rectilinear, near the crest of the ridge point S. of the one lane bridge on Silver Creek. After I'd watch a few minutes he stopped  $\frac{1}{2}$  way in a juniper tree, his anterior out of sight and stationary up a hole at the base. I left at ~~09~~ 0958. at 1040 hr I located C. molossus ♂ #9's sign under boulders w/ a rat nest  $\approx 200$  m N of the road & 100 m SSE of the middle "dolphin head" - in the same draws where he and ♂ #13 were last August. Couldn't see him.

July 31

at 0815 hr I located C. molossus ♀ #15 in a cavity under a ledge like rock - she rattled when I





Greene, H.

1993

July 31  
(continued) was sneaking up behind shrubs from  $\approx 3$  m away!  
I don't recall a concealed C. molossus rattling at me before! Clear and bright sun, she is in shade under rock. From 0830-0900 hr I sat above & east of her, jammed against a shrub on the edge of another rock - could only barely see an edge of her coils. Finally crawled down and lay  $\approx 0.5$  m in front of her hideout, took photos of her coiled facing out. As I took the 3rd shot she extended her head  $\approx 20$  cm & tongue flicked, then retreated to shade and withdrew her head out of view. At 0955 hr I found C. molossus ♂ #11 w/ his tail & posterior hanging out of a hole under a big ledge under a juniper on the east side of a big gulch that extends N. of Silver Creek. He has 7 segments, the last damaged, green paint on 3rd (base as 1st). In the course of getting down to him (around a big Neotoma nest in the ledge system) I fell down the embankment, breaking the antenna cable as I went through juniper limbs. Returned to Hardy's house for good cable & back, started up to C. molossus ♂ #9 w/  $\frac{1}{4}$  quart of water. Rock squirrel active on trail at 11:15 hr, very hot. Kept following higher falling a lot because of worthless 1-yr. old Merrill boots! Got pretty dehydrated, stopped



Greene, H.

1993

July 31  
(continued)

periodically to let my sweat drenched bandana cool my head by convection in breeze. Finally found him wedged in a crevice of red rocks E of (by  $\approx 20$  m) the base of the big "dolphin head" rock - in bright shade, looking out. Back at the Hardys I coded off, ate lunch, and went to Tucson to buy new boots - dinner w/ Billie & Dave, back in Portal  $\approx$  2230 hr. a little rain N. of the Dragoon Mts. each way and small pools where Portal Rd hits the State Line, but still very dry here.

August 1

Met Jay Cole, Carol Townsend, Herb Dessauer, and Michael Narine (high school student from NYC) at the pullout on our study site. at 0905 hr we spotted C. molossus ♀ #12 in a juniper stump  $\approx$  70 m high w/ a Nedona nest on top - she was in at the bottom; near top of right hand bifurcation of a gully due S. of the pullout and perhaps 100-150 m S. of Silver Creek. I then led us on a wild goose chase, having mis-punched #9's number looking for #3 - leading us across the canyon S. of Silver Creek and then up toward Dolphin Head before finally realizing my mistake! at 1105 hr we located C. molossus ♂ #3 coiled restly under a tree root,  $\approx$  5 m W. of his May 1, 1993 site on the N. bank of Silver Creek and close to the adobe ruin. There was another ♂ C. molossus



Greene, H.  
1993

August (continued) (now "3A")  $\approx 0.5$  m away under the same root, also in a resting coil (data in molossus file). Some storm & light rain around dusk, and Vince Roth found a Micruroides euryxanthus active at his house that regurgitated a Leptotyphlops.

August 2 Met Glen and Deborah, two friends of Sarah Schmidt's from Santa Rosa, at the pullout at 0800 hr. We found C. molossus ♂ #3 at the base of a bush in light sun,  $\approx 5$  m closer to the creek but still under the same tree foliage that sheltered him yesterday. As we looked on, he crawled  $\leq 1$  m under the bush and recoiled, no rattling. at 0840 hr I surprised C. molossus ♀ #12 as she was coiled in a hunting coil in the foot trail  $\approx 4$  m NW of the Newtona nest where we found her yesterday - she uncoiled and crawled leisurely to the base of the stump and entered it - green paint on her 4th segment (base = 1st). As we walked down the east side of the gully along a fence line I spotted a large ♂ C. molossus (now #18) w/ his front  $\frac{1}{2}$  in a "bear grass" clump that harbored a rat nest - rattled but no stake as I put him in a bucket w/ forceps. at 0950 hr we spotted C. molossus ♂ #11 crawling down & straight on an open terrace  $\approx 20$  m W. of the



Greene, H.

1993

August 2  
(continued)

ledge where I saw him yesterday. He crawled between Glen's boots as the 3 of us stood immobile - he was tongue flicking frequently the entire time and paused only a second or two to test the boots and then crawled out of sight in bushes. After putting the new ♂ at the Hardys' house and grabbing a sandwich I hiked up to the flagged site for C. molossus ♀ #14, used a flashlight, and couldn't see her. Hiked over the top (a little tricky, because this over a limestone escarpment where often one cannot safely reverse direction) and picked up her signal! Localized it to a hole in a shelf of rock (photos) ~75m ENE of the "red rock outcrop" where ♂ #8 once hibernated. Although lower in Silver Creek canyon the soil is bone dry (tho the creek trickles and has seeping pools), up on the ridge the soil is wet and there are scattered water pools on rocks. At ~1800h a Mexican laborer for Grey Mills brings us a huge ♂ Crotalus molossus (now #19) he caught (shoveled it into the back of his pickup) crossing the road at our pullout! I palpated the hind parts of a Nastorva from it.

August 3

No rain last night and hot from the start this AM. at 0755h I released the big C. molossus





Greene, H.

1993

August 3  
(continued)

♂ #19 at the N. edge of Silver Creek at the back of the pullout, intending to give him some time to "set his bearings" before encountering the road. At 0805hr I released C. molossus ♂ #18 at his exact capture site - he disappeared quietly and leisurely down a hole in the rat nest. At 0815hr I localized the signal of C. molossus ♀ #12 to the base of a huge juniper on the S. bank (actually 1st terrace) of Silver Creek,  $\approx 50$  m W. of the draw in which she was recently located. At 0820hr I checked the site where C. molossus ♂♂ 3 & 3A were yesterday but saw no blacktails. At 0830hr I spotted C. molossus ♂ #3 crawling  $\approx$  in the edge of the open area above the N. bank of Silver Creek,  $\approx 50$  m E. and above yesterday's site. He was crawling  $\approx$  straight at about 1m/45 seconds, tongue flicking, evidently unaware of me  $\approx 4$  m away. Next I hiked up to C. molossus ♀ #15, taking  $\approx 30$  minutes by way of the ridge (instead of up the canyon bottom) - at 0940hr I could see an edge of her coil protruding from behind a corner in the same hole as last time,  $\approx 30$  cm from the entrance. At 1020hr I localized C. molossus ♂ #11 to an area of dense brush on a terrace above the N. bank of Silver Creek & about 50 m SW of yesterday's site (he is  $\approx$  55W of the gravid ♀ #15). I



Greene, H.

1993

August 3,  
(continued)

crawled under the brush - very prickly! - but could not see him. That snake is especially adept at concealment above ground, tho he might have been in the ground. Judging from the transmitter signal I was probably w/in 1m, tho never a sound or movement. At 1700h a storm passed over this region that last 'til sometime after midnight, raining hard enough to make large pools on some roads - yet spotty enough to leave sections dry. I drove up Silver Creek Canyon at  $\approx$  1715h and could actually see the boundary of one extremely localized shower a few meters ahead on the road. From  $\approx$  1930 - 2200h I road hunted, first to Antelope Pass then to the San Bernardino Valley. Lots of toads - mainly Bufo cognatus & shik. Got 5 snakes. A Thamnophis marci was twisted and withering, obviously injured, and since a truck was coming I grabbed fast and tossed it on the passenger floorboard. A few minutes later it had disappeared, presumably beneath the seat, leaving a regurgitated toad. Much later, approaching the Hardy's house, I felt a snake crawling over my knee and w/ the cab light saw and grasped the Thamnophis! Unloading the car I couldn't find the dead toad, and palpation revealed that, at some point the snake had re-ingested it!



Greene, H.  
1993

August 4 Overcast and cool at 0700hr, partly cloudy and warming up by  $\approx 0915$ hr. at 1030hr E. molossus ♀ #12 is  $\approx 20$ m SW of yesterday, up the S. bank of Silver Creek, in a hunting coil w/ her head up on the horizontal root of a large oak. At 1110hr C. molossus ♂ #3 is in a large Nestora nest on the N. ridge above Silver Creek, S. of the road  $\approx 75$ m W. of the pullout. Accompanied by Earl Rawlins and Ben Dial, neither of whom are up to any strenuous walking.

August 5 Scotia Canyon, Huachuca Mtns., Cochise Co., Arizona  
Earl Rawlins, Ben Dial, and I spent last night at the "Western Motel" in Sierra Vista - strange little place run by Asian Indians w/ a porn channel on Cable TV and windows facing due east - so I was blasted away by sunlight  $\approx 0500$ hr. We drove across the N. edge of Ft. Huachuca and thus could see that the terrain between the Huachucas and Whetstone Mtns. is oak savanna and thus not suitable for Crotalus willardi. We walked around Scotia Canyon for  $\approx 1\frac{1}{2}$  hrs beginning  $\approx 0830$ hr but saw no snakes. Earl lost his balance in the creek bed and it took Ben and I close to 30 minutes to get him the  $\approx 15$ -20 feet up the embankment. He's 85 and has reconstructed knees, and



Greene, H.  
1993

August 5 (continued) seemingly just lost control of his legs. Just as we reached the top Ben fell on his already injured arm - I felt glad we weren't farther from the car!

Little Scotia Canyon, Huachuca Mtns., Cochise Co., AZ  
at 1020 hr we saw C. willardi ♂ #16's head facing out of the same bunchgrass clump where I'd previously seen him and localized C. willardi ♀ #17's signal to the same spot. I could not detect a signal for C. willardi ♀ #18 - recently implanted and parturient. at 1030 hr I spotted C. willardi ♀ #14 in a tight coil basking at the base of a grass clump ~0.5 m to the right of the rock where Fred Wilson & David Hardy saw her w/ the Lampropeltes pyromelana - she crawled deliberately w/out rattling into shady overhang of that rock & faced out at edge, then yawned four times during the few minutes we watched her. at 1120 hr localized the signal of C. willardi ♂ #8 to a rock in brush at the base of the "west" canyon wall, ~15 m to the right of where I saw him w/ a food lump on July 29th. at ~1130 hr I photographed C. willardi ♀ #15 coiled facing out on the ledge under a rock





Greene, H.  
1993

August 5 on the N. side of her little ravine - second of  
(continued) the two rocks she used when I was camping  
here last month. Lunch at the Cactus Flower  
Cafe in Sonora - quesadilla platter (w/ large  
fresh bake chilis) and homemade fresh cherry pie!  
Portal, Chiricahua Mtns, Cochise Co., Arizona

I drove back via Willcox (for groceries) and  
over the San Simon & Paradise Rd., checking  
some blacktails on the way. at 1700hr C.  
molossus ♀ #12's signal was in a Neotoma  
nest at the base of a century plant  $\approx 75$  m  
W. of the pullout and  $\approx 20$  m S. of the road.  
at 1705hr I spotted C. molossus ♂ #3 in a  
hunting coil in dense brush  $\approx 4$  m S. of the  
road and 1 m W. of the pullout.

August 6 Overcast and cooler this AM. at 0805hr I  
photographed C. molossus ♂ #3 in a loose  
coil under the culvert on the S. side of the  
road just E. of the pullout. at 0830hr R.G.  
Zweifel gave me an adult C. molossus  
♂ he found last night at the jet of the  
Paradise Rd. w/ the little mining rd. a few  
dozen meters E. of the "1-lane" bridge. at  
0845hr the signal of C. molossus ♀ #12  
is in a root tangle under an oak on the  
N. side of the road,  $\approx 100$  m W. of the  
pullout. at 0850hr C. molossus ♂ #3 is same.



Greene, H.  
1993

August 6 (continued) On the way back to Hardy's house I had a long chat w/ Kim Murphy, parked antiparallel in the road - about jaguars, dogs, rattlers, pouches, professions, etc. at 0945h I came upon an adult ♂ C. molossus crossing the road 0.5 mi NW of Cave Creek Rd. motionless and  $\approx$  straight. At 1027h C. molossus ♂ #3 is still under the culvert, but now his head is on the ground, facing out, at the entrance - an amberish posture? at 1030h. C. molossus ♀ #12's signal comes from the same root tangle, and as I approach a young Spermophilus variegatus goes down a hole at the base of that oak tree. By 1115h it is sunny and hot and I spot C. molossus ♂ #9 in a hole in dirt at the base of a bush, a loop out in the sun - tight fit, head and tail underground. He is  $\approx$   $\frac{1}{3}$  up slope from the deepest gully E. of Dolphin Head. at 1150h I get C. molossus ♂ #11's signal from a Nestona nest around a large red at the end of the dirt road running S. to Silver Creek,  $\approx$  50m N. of Silver Creek.

August 7 Overcast and cool. at 0800h I released C. molossus ♂ #20 and the C. atrox from the pullout at their original capture sites. at 0840h I get C. molossus ♂ #3's signal from a Nestona nest



Greene, H.

1993

August 7  
(continued)

around a fallen juniper snag under a bush,  $\approx 75$  m NE Pole 1,  $\approx 30$  m NE of the "shite-green" outcrop that is NE Pole 1. I climb the ridge and the sun breaks out. At 0910hr I find C. molossus ♀ #14 facing E. in a loose coil under a red boulder ledge on the N edge of the ridge,  $\approx 35$  m NW of last site. She was in dappled sun and didn't move while I shot photos - couldn't see tail or posterior of body. Met John Groves (North Carolina Zoo) at the pullout and we tracked the signal of C. molossus ♀ #12 to a rock pile under an agave (the 1st)  $\approx 75$  m E. of the pullout on the S. edge of the road, slightly SE of pole #1. John and I were racing to localize her because rain was starting and the lighting was disturbingly close. Spent the afternoon preparing to leave, as I learned yesterday I must be in Berkeley Monday night to prepare for an NSF Site Visit on Wednesday. So, I will attend the SWRS Advisory Council meeting tomorrow AM and then leave for California. Periodic storms this afternoon - I am leaving just as the monsoons are really getting going! Tremendous thunder storms periodically in the afternoon and



Greene, H.

1993

August 7  
(continued) evening. Limestone Mountain is dimly visible from the Hardys' porch, through a veil of gray blue mist. The thunder rumbles in a wonderful way - like someone moving heavy furniture by sliding it, except it's as if the mountains are being jostled.

August 8 attended SWS Scientific Advisory Committee meeting (w/ Wade Sherbrooke, director; members C. J. Cole, T. R. Van Devender, G. A. Middendorf, myself, and Diane Wagner [grad. student]). Wade gave me 2 Crotalus viridis arberus, a rattlesnake C. atrox, a dried DOR Sistrurus, and 2 Phrynosoma douglasi + one of them is 10 young for Kelly. A student volunteer gave me a C. molossus carcass (he kept the skin).





H. Greene  
1991-1998

Journal

1994

Calif: Contra Costa, San Joaquin Cos.  
one color photo *Hypsiglena torquata*  
Temperature/humidity tables



Greene, H.  
1994

April 30

Briones Regional Park, Contra Costa Co., California

On a field trip w/ my Natural History of the Vertebrates course, Elizabeth Barnosky (graduate student instructor) found a small Hypsiglena torquata under a rock on an open hillside above the lower pair of lagoons (we had come in from the Alhambra Valley Rd. entrance). A student, Minna Huang, photographed it for me, as we could not collect it under the circumstances.





Greene, H.

1994

May 6

Cornal Hollow, San Joaquin Co., California  
at about dusk, Brian Simon, a student in my Natural History of the Vertebrates course, found the shed skin of a Salvadora near the base of the grassy slope that forms the back (south) side of Castle Rock. This is interesting because Z. J. Vitt told me that as a kid he found a Salvadora just east of here but still in Cornal Hollow.

July 15

Two snakes received earlier, one a Tantilla hobartsmithi from Meredith Mahoney (grad. student here) and one a Crotalus willardi from Fred Wilson - this latter specimen received last Fall but not entered due to an error in the elevation sent me and our move to a new museum. The actual locality for the willardi is 1.2 mi S. of jct. of Hwy 83 and Ft. Huachuca Rd.,  $31^{\circ}31'20''$  long.,  $110^{\circ}30'5''$  lat., Range 18 E, Township 22 S; on section line of Sections 10 and 15, 300m from 12 mi. marker post (betw. 12 and 13 mi. markers, and 5 mi. W. of mouth of Algeita Canyon. Habitat is a rocky ridge w/ grass and oaks 200m. wide then sloping down to 5000' on either side. Found AOR/DO R at 1740 hr on August 8, 1993, by F. M. Wilson. Rattle w/ 5 segments, strong taper, no button. ♂ 480 + 60 mm, 106.8g, presumably in transit!



Greene, H.

1994

- July 17 Kelly Zamudio and I left Berkeley at  $\approx 1715h$ , after watching Brazil <sup>win</sup> ~~lose~~ the World Cup in soccer. Spent the night at a Motel 6 in Kingman Mojave, California.
- July 18 Went through a hailstorm E. of Kingman, Arizona, bad enough that we pulled off the hwy for a few minutes. Camped for the night at Sunset Crater National Monument.
- July 19 We drove through Wupatki National Monument, visiting first the namesake ruin. Then stopped at Lomaki ruin ("beautiful house" in Hopi) where we saw several Uta. As I was commenting on a Neotoma nest built in the window of one ruin, Kelly pointed out a wren perched nervously nearby w/ a grasshopper in its bill; soon the bird landed on the Neotoma nest, and we heard unseen baby birds crying from within - to which the wren disappeared.

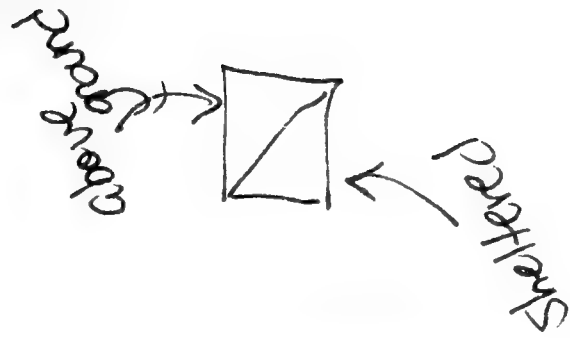




after a (hr) storm (light rain)  
 ~ 1315-1415hr.  
 now turning p.dly cldy

end 3:58 pm.

|                         |                           |                               |                         |                                      |
|-------------------------|---------------------------|-------------------------------|-------------------------|--------------------------------------|
| 28% 37°C<br>under rock  | 38% 37°C<br>under rock    | 33% 37°C<br>under rock        | 27% 39°C<br>grass clump | 28% 39°C<br>grass clump              |
| 49% 37°C                | 48% 36°C                  | 59% 37°C                      | 35% 38°C                | 45% 38°C                             |
| 25% 40°C<br>sun         | 24% 38°C<br>sun           | 33% 38°C<br>bunch grass clump | 27% 37°C<br>grass clump | 28% 37°C<br>grass clump              |
| 51% 38°C                | 52% 37°C                  | 55% 34°C                      | 67% 35°C                | 55% 37°C                             |
| 25% 38°C<br>bunch grass | 26% 37°C<br>under rock    | 32% 39°C<br>bunch grass       | 26% 37°C<br>under rock  | 28% 39°C<br>sun                      |
| 49% 37°C                | 41% 36°C                  | 45% 36°C                      | 37% 37°C                | 45% 37°C                             |
| 27% 37°C<br>bunch grass | 28% 36°C<br>bunch grass   | 25% 38°C<br>bunch grass       | 24% 39°C<br>bunch grass | 26% 38°C<br>not available sun (15cm) |
| 56% 34°C                | 49% 35°C                  | 50% 36°C                      | 42% 38°C                | 32% 38°C<br>under rock               |
| 26% 38°C<br>bunch grass | 26% 38°C<br>not available | 30% 36°C<br>mosaic            | 32% 37°C<br>bunch grass | 58% 37°C<br>under rock               |
| 32% 38°C                |                           |                               | 54% 36°C                |                                      |



- 1st south ravine  
 - north face slope  
 - 1st terrace above stream channel



Main study narrow  
 N slope, sunny clear  
 rained late  
 yesterday briefly  
 end 4:05 AM

|                                                              |                                     |                                     |                                     |                                               |
|--------------------------------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-----------------------------------------------|
| 32% 35°C<br>bunch grass<br>34°C 34%<br>mosaic <del>sun</del> | 31% 36°C<br>bunch grass<br>48% 36°C | 31% 37°C<br>bunch grass<br>30% 36°C | 27% 36°C<br>bunch grass<br>44% 34°C | 33% 36°C<br>under rock<br><del>54%</del> 35°C |
| 29% 36°C<br>under rock<br>57% 33°C                           | 30% 38°C<br>bunch grass<br>38% 36°C | 29% 37°C<br>bunch grass<br>33% 36°C | 40% 36°C<br>bunch grass<br>40% 36°C | 29% 36°C<br>bunch grass<br>31% 36°C           |
| <del>34% 38°C</del><br>34% 38°C<br>not available             | 30% 37°C<br>bunch grass<br>31% 37°C | 30% 36°C<br>Sun<br>not available    | 32% 35°C<br>bunch grass<br>41% 34°C | 27% 36°C<br>bunch grass<br>46% 34°C           |
| 27% 38°C<br>not available                                    | 27% 38°C<br>Sun<br>not available    | 28% 38°C<br>Sun<br>not available    | 32% 36°C<br>not available           | 27% 34°C<br>under rock<br>50% 34°C            |
| 30% 38°C<br>bunch grass<br>32% 38°C                          | 29% 37°C<br>not available           | 33% 36°C<br>Sun<br>not available    | 15% 37°C<br>under rock<br>53% 34°C  | 15% 37°C<br>not available                     |



• south wall of main canyon

• rained ~ 1 hr before grid measurements taken

end 3:22 PM

|                           |                                        |                         |                                |                           |
|---------------------------|----------------------------------------|-------------------------|--------------------------------|---------------------------|
| 29% 32°C<br>under rock    | 35% 31°C<br>bunch grass mosaic (ocast) | 39% 29°C<br>under rock  | 35% 31°C<br>under rock         | 35% 31°C<br>under rock    |
| 45% 31°C<br>Sun (ocast)   | 66% 29°C<br>bunch grass                | 53% 30°C<br>Sun         | 63% 31°C<br>Sun                | 43% 31°C<br>Sun           |
| 29% 33°C<br>not available | 31% 33°C<br>under rock                 | 33% 33°C<br>under rock  | 35% 32°C<br>bunch grass mosaic | 32% 32°C<br>bunch grass   |
| 31% 33°C<br>under rock    | 32% 33°C<br>under rock                 | 33% 33°C<br>under rock  | 33% 33°C<br>under rock         | 29% 32°C<br>bunch grass   |
| 34% 33°C<br>Sun           | 43% 33°C<br>under rock                 | 51% 32°C<br>under rock  | 34% 33°C<br>under rock         | 35% 32°C<br>bunch grass   |
| 31% 32°C<br>not available | 35% 32°C<br>bunch grass                | 31% 32°C<br>under rock  | 32% 32°C<br>not available      | 30% 32°C<br>bunch grass   |
| 37% 31°C<br>bunch grass   | 35% 31°C<br>under rock                 | 33% 31°C<br>bunch grass | 31% 32°C<br>under rock         | 30% 32°C<br>not available |
| 60% 30°C<br>Shade         | 49% 31°C<br>Sun                        | 43% 31°C<br>Shade       | 49% 31°C<br>under rock         | 30% 32°C<br>Sun           |





- N. facing slope (mostly all in shade/mosaic)
- main study ravine
- clear skies; sunny

|                                   |                                    |                                  |                                     |                                   |
|-----------------------------------|------------------------------------|----------------------------------|-------------------------------------|-----------------------------------|
| 50% 26°C<br>bunch grass<br>mosaic | 68% 24°C<br>bunch grass<br>shade   | 73% 23°C<br>under rock<br>mosaic | 65% 23°C<br>not available<br>sun    | 58% 24°C<br>bunch grass<br>mosaic |
| 69% 24°C                          | 73% 24°C                           | 76% 22°C                         | 53% 25°C                            | 76% 24°C                          |
| 53% 24°C<br>under rock<br>shade   | 55% 25°C<br>bunch grass<br>sun     | 53% 24°C<br>under rock<br>mosaic | 67% 24°C<br>bunch grass             | 50% 26°C<br>under rock<br>mosaic  |
| 67% 24°C                          | 65% 24°C                           | 67% 24°C                         | 55% 24°C<br>not available<br>mosaic | 65% 25°C                          |
| 49% 25°C<br>bunch shade<br>grass  | 53% 24°C<br>bunch mosaic<br>grass  | 53% 24°C<br>bunch shade<br>grass | 53% 26°C<br>bunch mosaic<br>grass   | 51% 25°C<br>bunch mosaic<br>grass |
| 65% 24°C                          | 61% 24°C                           | 71% 24°C                         | 47% 26°C<br>rock mosaic             | 67% 24°C                          |
| 60% 25°C<br>rock shade            | 50% 25°C<br>bunch mosaic<br>grass  | 47% 26°C                         | 53% 26°C                            | 46% 26°C<br>under rock<br>sun     |
| 70% 23°C                          | 65% 25°C                           | 68% 24°C                         | 54% 26°C                            | 69% 25°C                          |
| 53% 24°C<br>rock mosaic           | 64% 23°C<br>shade<br>not available | 63% 23°C<br>rock shade           | 61% 24°C<br>rock mosaic             | 52% 24°C<br>rock mosaic           |
| 73% 23°C                          |                                    | 78% 23°C                         | 71% 24°C                            | 53% 24°C                          |

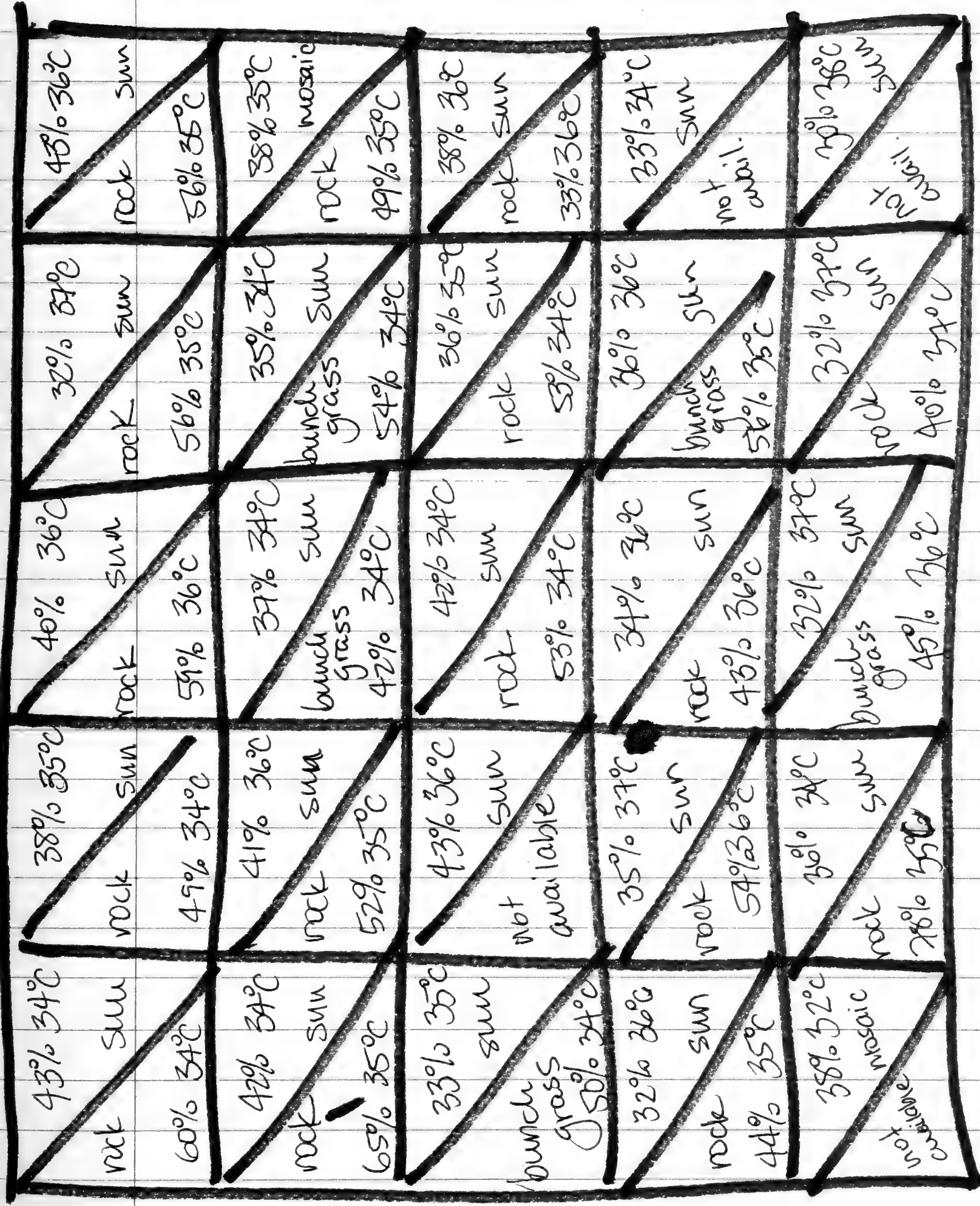
ent: 8:43





— NW facing slope of main study ravine  
 — sunny, after storm (rained hard 20m. @ 12:30 PM)

end 3:06 PM





- SE facing slope, main study ravine  
- mostly stony/mosaic

after 20 min. hard rain @ 12:30 PM

area 3:33 PM

|                                   |                                     |                                  |                                     |                                     |
|-----------------------------------|-------------------------------------|----------------------------------|-------------------------------------|-------------------------------------|
| 49% 29°C<br>rock sun              | 47% 29°C<br>bunch mosaic<br>grass   | 43% 29°C<br>bunch shade<br>grass | 38% 31°C<br>bunch shade<br>grass    | 33% 33°C<br>rock shade              |
| 67% 29°C                          | 66% 28°C                            | 62% 28°C                         | 63% 29°C                            | 53% 32°C                            |
| 43% 28°C<br>bunch sun<br>grass    | 40% 29°C<br>bunch shade<br>grass    | 40% 29°C<br>shade                | 43% 29°C<br>not mosaic<br>available | 41% 29°C<br>bunch mosaic<br>grass   |
| 64% 28°C                          | 63% 28°C                            | not available                    | not available                       | 64% 29°C                            |
| 43% 29°C<br>bunch mosaic<br>grass | 42% 29°C<br>bunch shade<br>grass    | 40% 29°C<br>bunch shade<br>grass | 39% 29°C<br>shade                   | 43% 29°C<br>not mosaic<br>available |
| 62% 28°C                          | 54% 28°C                            | 49% 29°C                         | not avail.                          | not available                       |
| 43% 30°C<br>bunch mosaic<br>grass | 42% 29°C<br>not mosaic<br>available | 39% 29°C<br>bunch shade<br>grass | 45% 28°C<br>not mosaic<br>available | 44% 28°C<br>bunch shade<br>grass    |
| 63% 30°C                          | not available                       | 52% 28°C                         | not available                       | 40% 27°C                            |
| 38% 30°C<br>bunch mosaic<br>grass | 37% 31°C<br>shade                   | 35% 32°C<br>bunch sun<br>grass   | 37% 31°C<br>not mosaic<br>avail.    | 42% 29°C<br>not mosaic<br>available |
| 55% 29°C                          | not available                       | 42% 31°C                         | not avail.                          | not available                       |





- stream bed of main study ravine
- overcast / partly cloudy

July 28, 1994

Start 8:19 AM

End 8:47 AM

|                                          |                                     |                             |                         |                                |
|------------------------------------------|-------------------------------------|-----------------------------|-------------------------|--------------------------------|
| 62% 24°C<br>not available<br>shrub (csc) | 62% 24°C<br>bunch grass<br>73% 23°C | 69% 23°C<br>shrub (csc)     | 72% 23°C<br>shrub (csc) | 69% 23°C<br>bunch grass mosaic |
| 67% 24°C<br>not available<br>mosaic      | 71% 24°C<br>not available<br>mosaic | 66% 24°C<br>rock shade      | 67% 24°C<br>mosaic      | 70% 24°C<br>mosaic             |
| 64% 25°C<br>not available<br>sun         | 62% 24°C<br>rock shade              | 63% 25°C<br>rock shade      | 67% 25°C<br>rock mosaic | 63% 25°C<br>bunch grass sun    |
| 56% 26°C<br>not available<br>sun         | 57% 26°C<br>rock mosaic             | 58% 27°C<br>rock mosaic     | 59% 27°C<br>rock sun    | 59% 26°C<br>sun                |
| 55% 27°C<br>not available<br>mosaic      | 55% 27°C<br>shrub                   | 53% 27°C<br>bunch grass sun | 58% 27°C<br>rock        | 56% 27°C<br>bunch grass mosaic |



- streambed and lower north slope
- overcast and partly cloudy

July 28, 1994

start 8:50 end 9:14

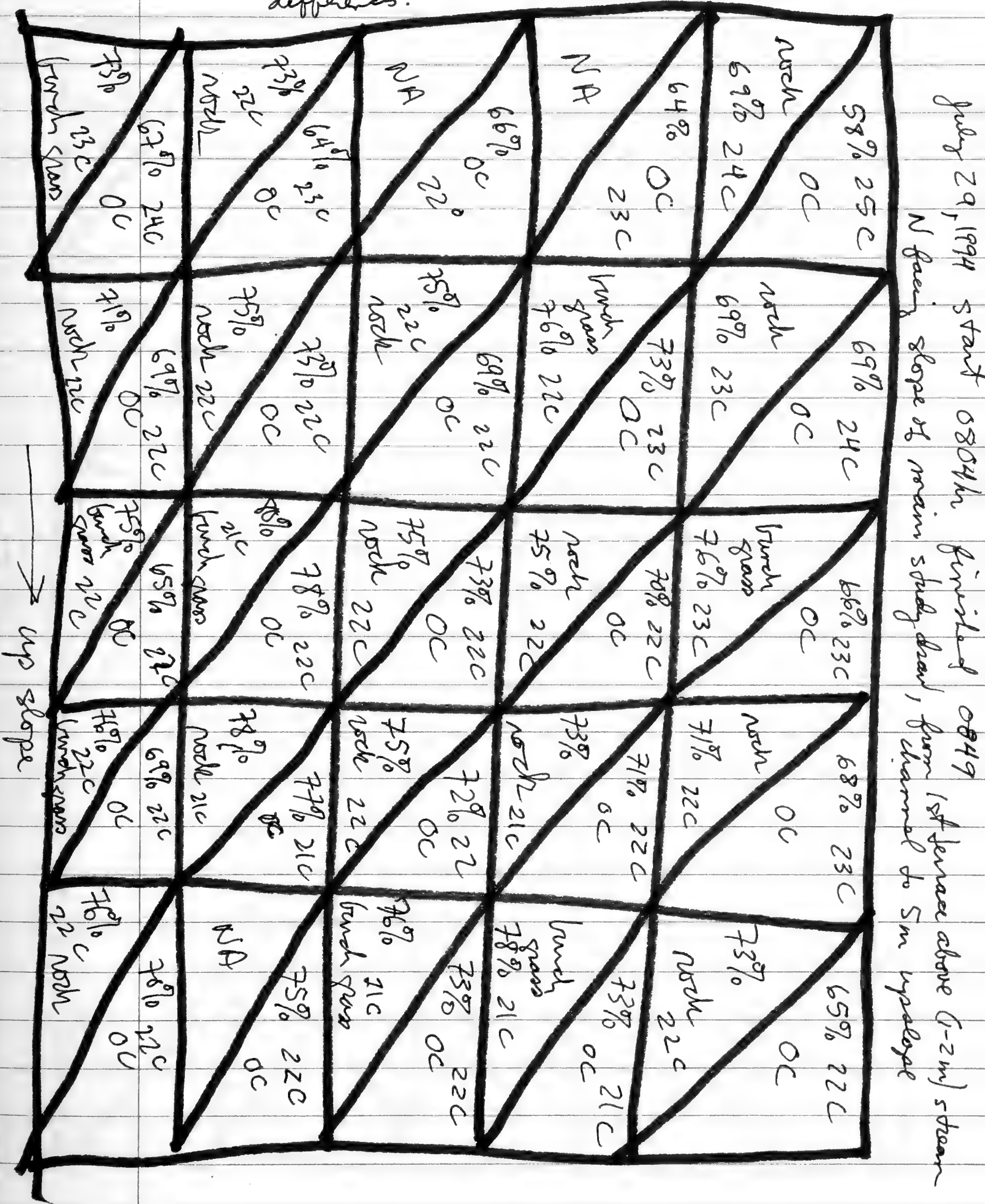
|                    |                        |                                |                                    |                         |
|--------------------|------------------------|--------------------------------|------------------------------------|-------------------------|
| not available      | not available          | not available                  | not available                      | not available           |
| 53% 27°C<br>shade  | 54% 27°C<br>shade (oc) | 55% 27°C<br>shade (oc)         | 54% 27°C<br>shade (oc)             | 52% 27°C<br>shade (oc)  |
| 57% 27°C<br>mosaic | 54% 26°C<br>rock shade | 53% 26°C<br>shade (oc)         | 53% 26°C<br>shade (oc)             | 55% 26°C<br>shade (oc)  |
| not available      | 56% 26°C<br>rock shade | 65% 26°C<br>rock               | 69% 26°C<br>rock                   | 69% 26°C<br>bunch grass |
| not available      | 57% 27°C<br>sun        | 52% 26°C<br>bunch grass mosaic | 52% 26°C<br>rock mosaic            | 52% 26°C<br>mosaic      |
| 54% 27°C<br>mosaic | 48% 28°C<br>sun        | 65% 26°C<br>rock               | 69% 26°C<br>rock                   | 59% 26°C<br>log         |
| not available      | 67% 27°C<br>rock       | 52% 27°C<br>mosaic             | 53% 27°C<br>rock mosaic            | 49% 28°C<br>bunch grass |
| 48% 29°C<br>sun    | 65% 27°C<br>rock       | 70% 26°C<br>rock               | 45% 29°C<br>bunch grass shade (oc) | 59% 27°C<br>bunch grass |
| not available      | 43% 31°C<br>sun        | 47% 29°C<br>sun                | 45% 29°C<br>shade (oc)             | 43% 29°C<br>shade       |
| not available      | not available          | not available                  | not available                      | 50% 29°C<br>bunch grass |

called "note" in computer file





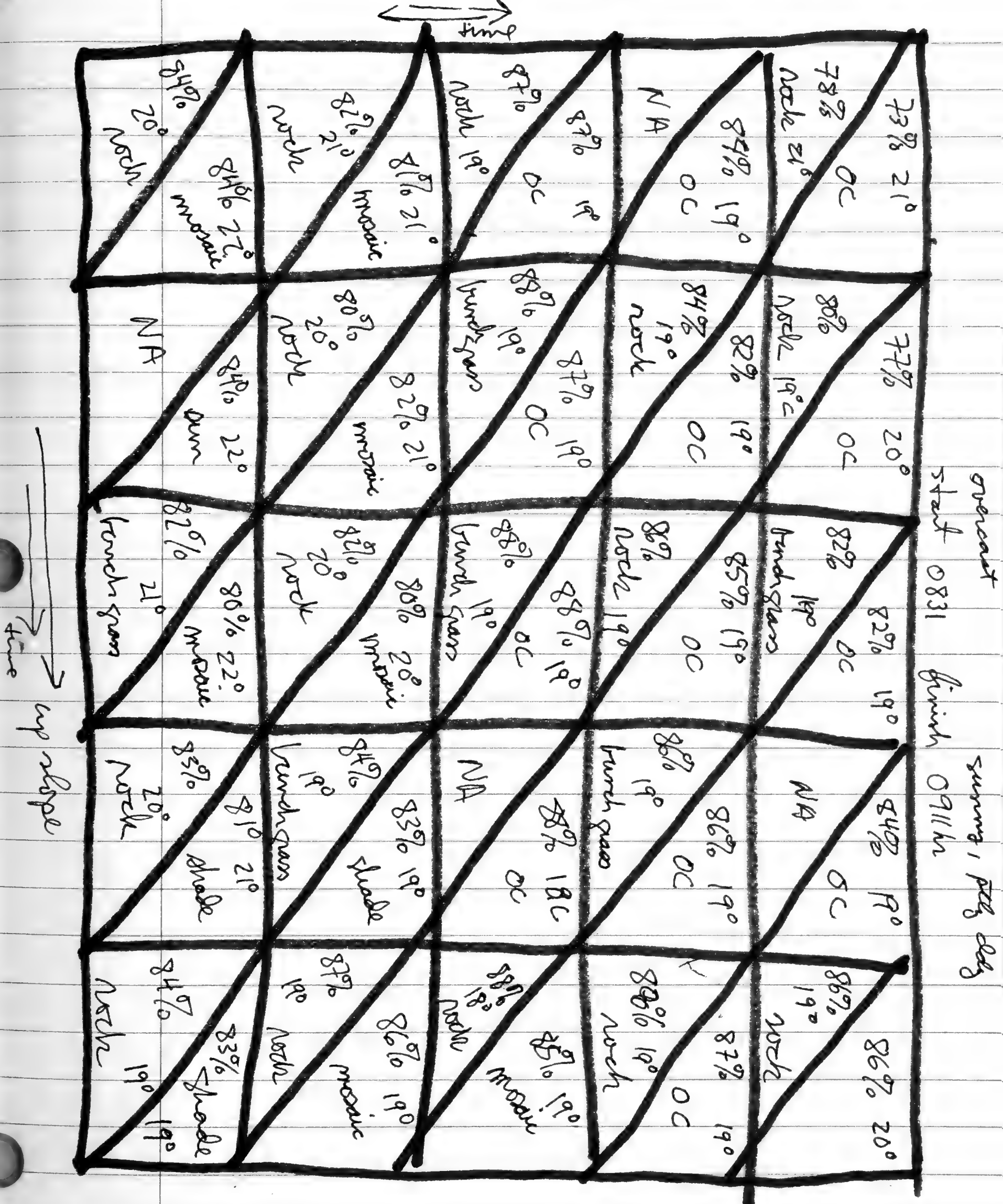
overcast, no rain since big one yesterday afternoon. Soil now obviously damp. NB: channel might be drier than slopes due to drainage, plant cover differences.





July 30, 1994 N face of main study draw,  
30 m N of deer skeleton, above where Phil  
found gravid ♀ in rocks at bottom last year.  
from bottom upslope.

up canyon, Rained  $\approx$  0100-0730 hrs.







Shells RH

Shells

~~Surface~~ RH

$N=206$

$\bar{X}=59.985$

29-88

grass RH

30-88 ( $N=87$ )  
 $\bar{X}=57.67$

rock RH

31-88 ( $N=103$ )  
 $\bar{X}=63.3$

Surface RH

$N=$  ~~47.24~~ 275

$\bar{X}=47.24$

19-88%

Total RH

$N=$

275 x 47.24  
206 x 59.99



Greene, H.

1995

May 26 Trilha do Travessão, 0.5 km S.  
Corrego Capão da Mata, Parque  
Nacional da Serra do Cipó, Minas  
Gerais, Brasil, 1300 m el.  
Marcia C. Zaza (recent PhD here under  
direction of J. Z. Patton) gave me a  
slide of this locality and another of  
a dark Bothrops she found here.  
She set traps for rodents and next  
day found the snake a short distance  
away, seemingly in a hunting coil,  
facing out from under the edge of  
a plant.





H. Greene  
1991-1998

Journal

1997

Hong Kong

Vietnam: Tam Dao



Greene, H.

1997

May 27

Upper Tramway Station, Hong Kong  
We arrived in Hong Kong  $\approx$  0630hrs, having left LA  $\approx$  14 hours earlier on May 25. Group consists of James I. Patton, Marjorie Matocq, Theodore J. Papenfuss, David J. Hardy, Sr., Kelly L. Zamudio, and me. Cleared customs and took ferry to island, then up tram to forested park. Kelly found a Tropidophorus under a rock  $\approx$  3 m from a small stream at 330m — very reminiscent of Neusticurus eclipus.

May 28

Hanoi, Vietnam  
We arrived yesterday  $\approx$  1600hr local time, very little trouble with our 17 pieces of checked luggage. Staying at Institute for Biological Resources and Ecology, courtesy of Cao Van Sung, Director and mammalogist. Joined by Michael McKee and Mark Moffett, journalist and photographer for National Geographic. Visited Zoological Museum to see Pseudorhynchus, then to market downtown, where various animals for sale — Lythron molurus, P. reticulatus, Varanus salvator, several V. bengalensis, some very sad looking Gehko gecko, and 2-3 Parasotriton deloustali. Cage bottoms made from old log playing records.



Greene, H.  
1997

May 28  
(continued)

McRae offered to treat us all to local cuisine, including Nikolai Orlov, Natasha Ananijeva, Sergei, and Oleg - Russians who have joined us. Cao Van Sung chose a little shack nearby and the meal was ghastly - brown foul dipping paste and strange meats!

May 29

Tam Dao, Vietnam

We arrived here  $\approx 1700$  hr after  $\approx 4$  hr ride in bus from Hanoi. All plains of rice paddies until just when we rise up into the mountain ridge. Nikolai has bought or caught about 400 snakes so far. We are housed in a small hotel at the entrance of a high valley, just downslope from a field station where we will prepare specimens and the Russians are sleeping. After dark we walk a road around the <sup>Upper Doop Rd., between great pond and stream</sup> upper edge of town, #17  $\approx 950$  m el., and Dave spots an adult Trimedon stepregeri in an arbush posture on a root across a trail that runs out of forest to the road - snake is at top of an embankment  $\approx 1$  m above road, but only  $\leq 8$  cm above ground adjacent to root, dense bamboo, trees, understory on either side of trail.



Greene, H.  
1997

May 30 We eat at 0800, 1400, and 2300 hrs! This morning after breakfast hunters start bringing in insects, snakes, lizards, and two brush-tailed porcupines (Atherurus, we later ate the meat, very tasty). We walk out narrow path to ruin on ~~porcupine~~ ridge protruding from the left and out to the south. Kelly finds Microhylax under rock at 1030 hr, 925 m, and Ted a Philantus. We walked down long staircase to pool below big waterfall visible from Hotel, el. 805 m (Hotel is at 850 m), passing women w/ little sheds selling cold drinks and stuffed tree shrews and ferret badgers. Kelly and I went to the newt pond at upper end of valley, edge of town, and caught a juvenile Sinonatrix trianguligera among several seen protruding from rock wall at water edge (930 m).

May 31 We are spending morning processing snakes from hunters. This morning's highlight was a gravid Xenopeltis unicolor from which I palped a rat, swallowed head-first. The Russians gave us a couple of dozen Trimeresurus of 3 species, from which we took live measurements, to eventually look at ecomorphological relationships among





Greene, H.

1997

May 31  
(continued)

these sympatric pitvipers. We have a Vietnamese journalist with us who w/ no prompting has collected two newts, one of which already dead. At 1850hr we visit newt pond and see a Paramesotriton  $\approx 30$ cm under water 1.5m from the bank, resting on a submerged cement bag. We walk up onto road along old french ruins and into them, and Dave Hardy found an orange-legged Scelopendra at 1940hr. At 2030hr Kelly finds a head and shoulders of a rat (white belly) w/ rest of torso clearly eaten (?) off, at 960m. Mark Moffett found a fly blown nose about the same time. At about 2130hr I sensed something like a mosquito bite on lateral surface of right hand and little finger; by 2300hr the whole digit red and swollen.

June 1

Finger still red and swollen, tends to bend, especially in joints. Hunter being in Leipeltis multianctus, which forms S-coil, bites, and often protrudes blue tongue. At 1545hr we installed a Hobo data logger at "Stream #1." Kelly and I walked up to TV tower, 1230m at top.



Greene, H.

1997

- June 1 (continued) at 1655hr Kelly installed a Hobo data logger at "Box 24",  $\approx 3$  m into forest and SW of the stairs, at 1195 m. After dark I got a huge (23g) caterpillar out of a tree,  $\approx 5$  m up - Dave Hardy spotted it.
- June 2 Last night at dinner, teasing Mark Moffett about being a Harvard PhD, he says "So I guess Silence of the Lambs is a procedural manual at Berkeley?" While we pickle snakes, a German tourist comes by to chat, comes here to collect snakes and is very excited about having an "Elaphe leonardi - never before photographed!" Dave Hardy asks him about permits and he says "Please ask me an easier question." At night we descend the bed of "Stream #3" w/ Ted, who at 1955hr, 895 m, grabs an immature Sinoratrix trianguligera as it swims in a small pool. At 2110hr, 870 m, I grab a small Amolops  $\approx 20$  cm above ground on a small plant  $\leq 3$  m from the stream bed. Later, walking the Upper Zoop Road we catch a Gekko sinensis 30 cm above ground on a stone wall, 2215hr, 955 m. Ted catches an Elaphe porphyracea crossing the road at 2225hr.



Greene, H.  
1997

June 2 950m; it struggles and bites when  
(continued) seized.

June 3 We have a routine of processing animals and photographing animals in the morning, a nap after lunch, and hunting from  $\approx 1830-2230$  hr. Tonight we check the old french stone ruins on the upper loop road. at  $\approx 2100$  hr Kelly finds a Zygodon crawling on rocky ground among sparse plants, beside ruin stairs, 960m; struggles, bites and cloacal discharges when handled - I've noticed Zygodon have an seem to irbed the front teeth when held. At 2115 Kelly spots a Dinodon (we think this is an undescribed species, maybe new genus) crawling slowly in the concrete ditch between road and rock wall,  $\approx 960$  m, it struggles and bites when handled. at the next pond, at 2145 hr, I spot a medium size Sinonatrix trianguligera w/ just head protruding from surface vegetation mat,  $\approx 3$  m out from bank. After several minutes Kelly tosses a stick beyond it, thinking to drive the snake shoreward, but instead it seems to pursue the



Greene, H.  
1997

June 3 (continued) splash - swims rapidly on the surface in a broad arc of  $\approx 5m$ , out by the splash, then returns near shore where I grab it. Snake bites, cloacal discharges, and spins along its entire long axis. Nikolai agrees w/ my hunch that a fair proportion have incomplete tails. Tonight he and the other Russians got Pareas, Lycodon, 2 of the new Dirodon, and his putative new genus - a cat-eyed big snake that looks a lot like Trimeresurus mucrosquamatus, that we are informally calling "Pseudoboiga". I agree it is a dramatically new species and Nikolai says it has different teeth than Boiga.

June 4 flickle & photo animals in the morning, still no rain since we arrived! Scattered clouds and thunder some afternoons. Forest seems dry, streambeds are dry except for small pools. Hunters brought in a striped juvenile Sus scrofa, and its meat was excellent. We walked out "old french road" for  $\approx 3$  hrs, and missed a Trimeresurus mucrosquamatus - it was crawling straight in trail toward us and suddenly rapidly escaped.





Greene, H.

1997

- June 4 (Continued) off trail in dense vegetation, 980 m. At one point I thought five people w/ headlamps were approaching us from scattered points, but they were just the largest brightest fireflies I've ever seen! Checked the newt pond - 1 Sinorhiza trianguligera juvenile, no Paramesotriton. Ted meanwhile had gone to Vinh Yên with the Natl. Geographic folks to visit a snake market, and bought me a huge pregnant Enhydryis bennetti.
- June 5 Mike, Mark, Cuc, Natasha, and Nikolai left early to attend a wildlife release ceremony in Ba Vay, to be gone two days. Last night Ted caught an adult Trimeresurus microsquamatus ( $\sigma$  745+174 mm, 97g) which we GT implanted under light anesthesia ( $\approx 1.5$ g radio, 148.716). We released him at capture site on middle loop road,  $\approx 100$  m from jct. with upper loop road,  $\approx 1845$  hr. Walked down middle loop road to cisterns on old french ruin slab to collect 10 Polypterus leucomystax. Walking back up we find a T. microsquamatus in coil, possibly just retracted as we walked up, on edge of road at 2005 hr, 905 m. At 2100 hr



Greene, H.

1997

June 5 (continued) we cannot relocate signal of our T. mucrosquarmatus. W/ Kelly we catch 10 more Polypedates leucosmyx and 2 Paramesotriton at newt pond.

June 6 Restless night, we left the balcony doors open and maybe weren't used to frogs and other night sounds. Still hot, no rain since we arrived! at 1100hr Dave and I seek telemetered T. mucrosquarmatus, walking  $\approx 200m$  of road as well as over bluff of grassy ruins above rock wall. Very hot and sunny. Tam Dao seems to be prospering, so to speak: well dressed couples w/ parasols stroll the loop road where we hunt snakes at night, now sounds of hammers and electric saws from all around valley below. at 1205 hr I check water temp at edge of newt pond,  $\approx 6cm$  below surface,  $27.7^\circ C$ . Photo of kids w/ their fish net stung out into pond. As I get ready to night walk at 1800, feel sticky patches in my clean shirt, large dipteran (?) falls out, and discover several 2-4 cm patches of tiny yellow eggs on my belly, back, arms! We try again and



Greene, H.

1997

June 6 fail to locate telemetered T. mucrosquamatus (continued) along rock wall, both from middle loop road and upper loop road. at 2015hr, 905m, as we walk down road at "Stream 3" a car passes and we find it has just hit a smallish T. mucrosquamatus. We visit the big waterfall, see 8-12 frogs scattered over the almost vertical wet rock face. Frogs seem to be a meter or more out from the actual torrent; Amphibians and one big ♀ Rana livida are  $\approx 5m$  up, but several smaller R. livida are w/in 1-2m of the pool at the bottom.

June 7  $\approx 10:30$  we implant an adult ♂ Trimeresurus stejnegeri (565+151mm, 55g) that Oleg caught last night near "Stream #2." Note that last night I saw a 30cm 10-15 mm ♂ earthworm - one often sees earthworms here and they seem surprisingly resistant to desiccation. Not only do we often see them out and crawling, but ones we find dusty on the road are alive. Makes more understandable the existence of a large scansorial diurnal worm-eater, Cyclophorus major. This morning Nikolai told me that the Xerophelis he gave me had regurgitated an Amphisbaena.



Greene, H.

1997

June 7, stolata. Lunch included fried hard  
(continued) boiled eggs, a fruit for us all. We always  
have at least one kind of cooked vegetable  
or greens, e.g., shredded squash cooked  
w/ small pieces of beef. Usually one or two  
other meat dishes, small chunks sometimes  
mixed w/ onions and tomatoes. Usually one  
fresh fruit - mango, papaya, watermelon.  
We supplement w/ bread and peanut butter.  
Always rice, sometimes sticky w/ some  
other small yellow grain cooked in it.  
at 1900hr we release Trimeresurus stejnegeri  
w/ radio ("TS#1") at capture site, among  
huge boulders in bed of "Stream 2", above  
where it crosses the road near the tower  
stairs and  $\approx 30$  m above some sort of  
new concrete water (?) facility. The snake  
immediately went under a 3m boulder  
on the edge of the stream. At 1905hr,  
just as barely dark in forest Megophrys  
lateralis start blasting so loud we  
have to harass nearby males to hear the  
 telemetry receivers! We are at  $\approx 970$  m d.  
We saw big thunderheads to the west at  
1800hr and BP has dropped 933-919, but  
still no rain. By 1945hr TS#1 has  
moved 3-4 m above big boulders of stream





Greene, H.

1997

June 7, bed into a bamboo thicket on the West  
(continued) (?) or ~~too~~ away from staircase side of  
stream, but we can't see him. Descend  
to road and walk. At 2015 hr, 905 m,  
2 Polypedates leucomystax 2 m above ~~and~~  
ground,  $\approx 50$  m from staircase toward  
old french ruins. At 2020 hr, opposite side  
of road, a P. leucomystax 40 cm above  
ground. (I am collecting these for Kelly,  
who is investigating the possibility that  
there are two morphs or species of this  
frog.) At 2040 hr I watch a moderate  
size orange-legged Scelopendra crawling  
on a tree limb 2.5 m up, horizontal,  
seemingly foraging, swing foreparts  
side to side. At 2055 hr Dave Hardy  
spots a big ♂ Trimeresurus stejnegeri  
(598+148 mm, 69.5 g),  $\approx 20$  m toward  
staircase from junction of new pond  
road on upper loop road, 905 m.  
The snake was in an ambush posture  
on a dead horizontal bamboo stick  
(10 mm  $\phi$ ) connecting for 35 cm a  
live vertical bamboo, to which snake's  
tail connected, and a 10 cm  $\phi$  tree  
fern trunk,  $\approx 2.2$  m up. We photographed  
and snake only struggled when I



Greene, H.

1997

June 7 (continued) seized gently w/ forceps. At 2117h I catch a P. leucomystax on a vertical stick in the concrete ditch, 45 cm above ground,  $\approx$  50 m toward old french ruins on upper loop road from jct. w/ new pond road.

June 8 Still clear and hot. We GI implant the green pitviper, now "TS #2." This afternoon during El Nago Kelly found a tick on my right elbow and another in my beard, the latter slightly implanted in my chin - a first. I wonder if they are the fruits of sharing space w/ mammalogists. At 1835h we release TS #2 at the capture site and he crawls up the tree fern trunk and out of sight into adjacent bamboo, seemingly unhurried. At 1920h, 960m, we get TS #1 signal  $\approx$  20m downstream &  $\approx$  3m away on same side of stream, seemingly in bamboo, but can't see him. Kelly catches two Anolis richellii on small cascade face under a big boulder, one w/ 2 leeches and one without. While she's under these spots a Sinonotus trianguliger protrudes from tiny pool, which I catch - it spins and bites.



Greene, H.

1997

June 8  
(continued)

As we walk down stream, discover that strongest TS#1 signal is uphill from the concrete water facility. At 2025hr we get a P. leucomystax 10m from Stream 1 toward old french ruins, 925m, 1m above ditch on a stick; 5m further, a larger frog 1.5m above ground. At 2045hr we locate TS#2 signal near road and 85m toward old french ruins from first site. Going by newt pond I spot two seemingly slender reddish snakes in the stagnant pool below the spillway bridge, manage to catch one and get good look at the other, and they are Sinondra trianguliger.

June 9

Hot and clear, talking about water shortage in Tam Dao; Nikolai has been coming here for years and has never seen such a dearth of rain. While we process newts, frogs, and snakes, Dave goes to check the two Trimerurus stejnegeri; returns at 1200 - couldn't get signal from TS#2 localized signal of TS#1 to a small area in leaf litter but couldn't see the snake. Anniops rickettii from last night had shed two ecdyses in the bag, and today one is



Greene, H.

1997

June 9  
(continued)

back in! We photographed and videotaped leech partially emerging and retreating thru vent, and presumed must be in gut. After frog died during handling I opened the ventral skin and then the ventral peritoneum, confirming that the leech is in the coelomic cavity and pursuing it w/ forceps as it retreats behind organs. After lunch trouble napping because so muggy and I am sweating on the pillow. At 1720 hr, looking out room balcony and musing, the sky is largely cloudy, cicadas starting their loud buzzing, a big blue and black butterfly cruises over the foliage below. There are many beetles in Tam Dao (Nikolai says 1500 species of cerambycids), and lots of lepidopterans, spiders (including a totally black woolly tarantula Mark got out of a burrow in a roadcut), hornets, flies, grasshoppers, crickets, katydids, and ants - but, the guide book notwithstanding, very damn few birds. In fact, the first birds I've actually seen were last night - four tiny songbirds w/ a downy look (mainly white from below, striped heads),





Greene, H.

1997

June 9,  
(continued)

as if nestlings or fledglings, sitting on a leafless branch protruding vertically  $\approx 2$  m above surrounding vegetation against a black stormy sky. They were huddled in a line, two facing each way w/ heads over the branch, so we could only clearly count them by the four clearly divergent short tails, two angled out to each side. They looked very lonely, vulnerable, almost desperate — safe from climbing snakes only because of the extreme dryness which has snakes hunkered down (Nikolai found two Bungarus multicinctus last night, one under a rock and one buried in leaf litter, such that he glimpsed only a tiny patch of pattern.). At first the little clump of birds looked odd and unrecognizable, perhaps a strange inflorescence. Also, as we readied for last night's walk, well before dark several raindrops landed, but no downpour. At  $\approx 1900$  hr Kelly catches an Anolis richettii under the same boulder in Stream #2 as the earlier two, and suddenly about ten seconds of rain falls, just enough that I



Greene, H.

1997

June 9,  
(continued)

slip on a startling boulder and crash off part of my lantern. at  $\approx 1930$  hr, Dave Hardy locates and we photograph TS#1 in a hunched posture  $\approx 1$  m above ground, on slope toward town above concrete path by water facility. Site is  $\approx 30$  m up slope in moderately dense vegetation, perhaps 50-75 m from release site. The viper is on sort of a stick tripod, w/ its tail grasping a vertical stick below the horizontal body and S-coil in anterior. When I moved closer ( $< 2$  m) for photo, he slowly moved up a dead end branch, retraced, and crossed horizontally on connecting vegetation to adjacent branches. Occasional tongue flicks but the snake didn't seem disturbed. At 1945 hr as we walked the upper loop road, got a Polypedates leucomystax  $\approx 20$  cm above ground in dense vegetation, just above road cut, between lower stairs and Stream #1. I had to lift Kelly up the embankment and she semi-fell down, banging her arms and back. I found two small yellow birds roosting together 3 m up in bamboo. At 2035 hr



Greene, H.  
1997

June 9  
(continued)

we watch a 50-60 cm Sisonatrix  
trianguligera in water a few meters  
from the deep end shore of the newt  
pond; it crawls w/ head raised above  
surface vegetation, often tongue flicking.  
We catch a 3 cm Polypedates bucconyx  
and throw it from above, lands  $\approx$  50 cm  
from the watersnake. The frog hops once,  
and the snake dashes, chases across surface  
for  $\approx$  3 m and catches the frog underwater!  
For  $\approx$  3 minutes we can see only movement  
beneath surface vegetation and an  
occasional out-poking frog foot or snout.  
Then snake head emerges holding frog  
at waist, swims 2 m over surface  
vegetation w/ the frog dangling and  
seemingly immobile, and swallows  
the frog, hump first w/  $\approx$  20 cm of  
the snake actually up on the shore.  
Finished at 2041 hr, tongue flicks,  
and crawls back into and under  
water. At 2044 hr we throw down another  
frog, which is seized at 2045:37, twice  
jaw-walked over torso and then  
initiated head-first ingestion at 2046:27,  
finishes and tongue flicks at 2047:52,  
goes under water and emerges head,



Greene, H.

1997

June 9  
(continued)

torque flicks. About 2050 hr the snake swims under surface directly ~~to~~ 5m, above a Paramecium deloustali w/out any evidence of recognition by either. Then snake swims two 4-5 m long, wide arcs out into the pond, seemingly chasing distant water insects and/or tadpoles. We see a 2 cm water insect move  $\approx$  30 cm on surface vegetation and suddenly two nearly juvenile Sinonatrix trianguligera materialize and turn toward it, then away and out of our view. Then we see a second 50-60 cm Sinonatrix resting in subsurface vegetation  $\approx$  3 m from shore w/ obvious sagging food load. We throw two Polypedates near it but evoke no attacks. At the station Nikolai has caught a big Dipsosaurus cf. rufozonatum w/ obvious food bulge, from which I palp a head-first swallowed large gravid Megophrys laternalis. In the process Kelly and I are each bitten repeatedly by the snake, and it slings cloacal gland secretion and uric acid over all three of us. Later I say "Nikolai, sorry the snake slit on you," and Natasha grins and says "it's not the first time!" He also got a big laevis margantophorus.





Greene, H.

1997

June 10

~0600hr a tremendous wind storm wakes me.

By 0700hr sky is dark overcast and there are wispy clouds on the peaks. (an aside: I can't recall anything comparable re terrestrial frogs as prey and tropical forest to the abundance and visibility (and audibility!) of Megophrys lateralis in the stream beds here - maybe some of the big Eleutherodactylus?). At 0730hr

the clouds are streaming down the canyon outside our window, the surrounding ridges obscured by mist.

In the AM Kelly and Margot check several sites w/ GPS, while Dave Hardy radiolocated the TS #1 to leaf litter on the ground near last night's site. At

1600hr British film crew arrives to do segment for Discovery Channel w/ me, on snake evolution, led by Ailsa<sup>aez</sup> and Brendan. Discussion w/ Kelly, Natasha, and Nikolai re Lycodon - Dinodon project, for which KZ will do the molecular work.

By 1700hr Tam Dao almost totally socked in w/ clouds and very light fine drizzle - and more biting insects. At 1920hr a Polypedates leucomystax 2m above ground and 10m from staircase



Greene, H.  
1997

June 10  
(continued)

toward Stream #1. At 1935hr two P. leucomystax each 1 m up, between staircase and Stream #1. Dave and Marvalee Wake and Carol Patton arrived  $\approx$  1800hr.

June 11

Walking loop roads I find a fairly fresh DOR Silhynophus chinensis at 1040hr. After dark go to staircase w/ Kelly, Dave Hardy, and film crew. By  $\approx$  2015 Dave leaves to check telemetered T. stejnegeri and the film crew poops out. At 2030hr I get a Rhacophorus appendicularis = (R. verrucosus) in earlier notes from here) on a stem 0.5m above embankment from staircase, at 1000m. At 2045hr, 1000m, we photograph undisturbed and collect a Trimeresurus stejnegeri, horizontal on a fern stem w/ head toward base, body parallel to and  $\approx$  30cm above ground at top of embankment. Only reaction to capture w/ tong was struggling. At 2100m, 980m, near Box 13, I climb up vegetation and catch a Polypterus leucomystax 2m above ground on vegetation at top edge of embankment, and soon after climbed the base of a tree for another frog (for Kelly) but it left into the valley below. At 2150hr



Greene, H.

1997

June 11 Kelly and I catch T. mucrosquamatus AOR at construction side of new pond, only struggles when captured - later sticks many times in plastic bag. Later Dave Hardy caught a huge Ichthyophis on the dirt path through grass and gardens between station and hotel. Ted had gone w/ others to lower waterfall and caught a small ♂ T. monticola coiled w/in a few meters of the cascade pool, and I collected fur from its feces. They saw and Mark Moffett photographed a copulating pair of Simoratrix trianguligera in the pool.

June 12 Spent the AM w/ the film crew. At  $\approx$  1700 we took a van of 14 people w/ Ted & film crew to lower falls. Two Vietnamese carried a 200 lb. shug on a bamboo pole down a very steep path through dense grass, then forest to the boulder strewn running stream. At 1830 hr the film crew's English speaking liaison from the Ministry of Culture started yellin' "snake snake". He was pointing at a sphingid caterpillar that looks like a dark and green ~~pitraper~~ banded pitraper. A few mm posterior



Heere, H.

1997

June 12 (continued) to the real head is an enlarged snake head, and when disturbed the caterpillar ~~the~~ retracts its head and the enlarged part looks like the end - has fake scales, eyes, dark head stripe!  $\approx 6-8$  cm long. We worked maybe 100 m upstream to waterfall, but saw only Amolops nicketii in the vicinity; Ted saw 2 Sinonatrix triangularis in a downstream pool and caught one for "capture" on film at cascade pool. I palped one hind leg of a big Amolops out of it that had been swallowed head-first. Big rain storm from 2030-2200h, including lots of distant lightning and thunder that rolled  $\approx 1$  minute at a bout. Kelly had gone w/ Wahes to cisterns and newt pond, and at latter saw a Sinonatrix thrashing in water.

June 13 Cool night, now bright blue sky. Moffett at breakfast, frustrated that Kelly has collected ♀ P. leucostictus at cistern where he tried to photograph mating: "I was up til 1AM waiting for a female any female from anywhere!" This AM Kelly and Wahes check their tadpole trays at the newt pond and discover that the thrashing Sinonatrix was trapped in a





Greene, H.

1997

June 13 net. When injected w/ New Butal it regurgitates  
(continued) a huge ♀ P. leucomystax that had been  
swallowed stump - first. Nice conversation  
w/ Natasha and Nikolai at lunch about  
Russian movie we and they all like very  
much, Close to Eden in English and Teintory  
of Love in Russian. New item on menu - pickled  
baby eggplant, very salty and not especially  
tasty, but Nikolai likes them a lot. He  
says Trimeresurus easy to breed: lower  
night temps to 15 C, day temps to 18-20C,  
for three months. Must ask him about  
seasonality of breeding in Old World crotalids.  
Out w/ film crew to fake telemetry w/  
borrowed T. stejnegeri, then walking upper  
loop road. At 1920hr, 945m, Dave Hardy  
spots a small adult T. stejnegeri crawling  
in the concrete ditch between new road  
and the first (heavily under reconstruction)  
ruin; only response to songs was crawling.  
Leave film crew  $\approx$  2030hr and join Kelly  
and Marjorie on lower reaches of staircase.  
Missed one huge P. leucomystax  $\approx$  3-4m up  
in tree. Recall funny remark by Mawalee  
at lunch, re latrine scene at cisterns:  
"Those weren't banana slugs up there!"



Heene, H.  
1997

June 14 Big thunderstorm hit  $\approx$  0300h and heavy rain fell until  $\approx$  dawn; thunder usually 3-6 seconds after lightning flashes and so frequent often a new flash before previous thunder rolls off. This was finally reminiscent of other tropical downpours I've experienced. at 0730h I awake to no rain, lowlands totally soaked in and misty clouds on the surrounding peaks, and the sound of the waterfalls in the canyon is louder. After breakfast Jim's trapper brings in a moon rat, a big insectivore looking to some neotropical marsupials, and Patton is really excited. At noon I sit out on our balcony w/ coffee, watch misty irregular squadrons of clouds stream up the canyon like floats in a celestial parade. Thinking about Vietnam War, how incredibly hard and unsettling to have humpered a pack and fought in such terrain (e.g., leeches) and how astounding that this relatively backward country withstood and triumphed over U.S. military power. Back to mountain ridges, not once here have I seen a bird flying - though Dave Hardy



Greene, H.

1997

June 14  
(continued)

says he saw some in the forest at the T. s. #1 site - especially striking in looking out over the forest here and recalling frequent views of turacos in Uganda and parrots and toucans in Costa Rica. More irony here in high snake species density: most forest in the immediate vicinity of Tam Dao is second growth or at least has long since been selectively logged. See few trees w/ dbh  $> 20$  cm, let alone really big trees, and 'lots of bamboo, hard to walk through understory'. And often hear the roar of motorcycles, even at dawn and late at night. But lots of moths, beetles, and astounding cicada choruses. After dark Dave Hardy and I walk from town past cisterns and on to upper loop road in gentle rain that becomes cold and windy. Lots of frogs on road and vegetation. We go to check our telemetered green pitvipers, and I spot an adult Trimeresurus stejnegeri vertical stretched on a sapling  $\approx 3-5$  cm diameter, w/ head down in S-coil and 30 cm' above ground  $\approx 2$  m off concrete walkway  $\approx 30-40$  m from T. s. #1.



Greene, H.  
1997

June 14  
(continued)

After a few seconds in our lights, before we can get photos of original posture, snake slowly turns up seapling. Dave locates Dendrotyphlops signal snake place in leaves. at  $\approx 2145$  hr, while I'm photographing Microhyla in flooded grassy lot across road, Dave Hardy spots a largish Sinonatrix trianguligera grappling w/ a huge ♀ Polypedates leucomystax (next morning, after laying eggs in sack overnight, SV 98mm, 56g, KZ 269). ~~It~~ Actually Dave saw the snake swim  $\approx 10$  m from out in the pond and seize the frog (which must have been in water initially). At 2155 hr when I arrive both are struggling, writhing, then floating, seemingly exhausted. No obvious constriction, and generally the snake's body is extended, sometimes contorted, either on surface or less frequently dangling down in water from floating (greatly inflated) frog. By now, snake has frog only by toes, and at times frog is swimming on surface but unable to pull free. at 2200 hr snake has swallowed entire left leg, its throat obviously expanded and jaw





Greene, H.

1997

June 14 movement visible from our vantage on the (continued) bridge above. The frog has obvious dorsal wounds. at 2204 hr they abruptly drop beneath surface and disappear in water  $\approx 1.5$  m deep, and for  $\approx 3$  min we see only occasional bubbles until they abruptly surface w/in seconds separate, and they both swim away. Snake proceeds out of the square spillway area and toward the deep (wall) end of pond and I lose it. A few minutes later another but distinctly smaller snake swims through the spillway area at times w/in 1 m of frog, and then departs. I extend a long piece of bamboo to the frog, it climbs on and is captured. Marvlee and Ted caught a Trimeresurus stejnegeri <sup>#HWG 3119</sup> on the staircase, healthy looking adult ♂.

June 15 Cool, overcast, and windy when we get up. The injured ♀ P. leucomystax has oviposited in her bag and is still alive, thus seemingly not seriously envenomated by the Somatrix (she is now 98 mm SV, 56 mm in KZ's catalog). The T. stejnegeri I found last night is w/in 1 g and a couple of mm exact measurements of



Acene, H.

1997

June 15  
(continued)

TS #1, and this AM Dave Hardy finds the latter's transmitter, clear and lying on leaf litter at his previous site - so we are fairly sure the snake I found last night is TS #1, and accordingly we GI implant him w/ another transmitter and Dave releases him in litter at capture site. At 1700h Dave Hardy, Kelly, and I hike out "Old French Rd."  $\approx 3$  km ( $\approx 50$  minutes) to where it turns as a westerly (?) ridge running toward three peaks, thence 300-400 m down that trail. On the last part of this last stretch the forest is more open than any I've seen here, w/ lots of crumbly moss covered rocks and rock outcrops, and lots of huge spiny plants I think are like the big dark green terrestrial bromeliads at La Selva, but Mark Moffett later tells me are Pandanus palms. We see several land leeches and Kelly momentarily freaks out at one on her hand. I have to tell her sternly to stop shaking her hand so I can pull it off. At 1830h, almost dusk, Kelly misses a skink in leaf



Greene, H.  
1997

June 15 (continued) little ~~long~~ the trail. We pause at a plank platform, seemingly made by wood cutters, ~~take~~ in the view (mostly shades of green, but two trees in sort of dark apple red throughout, on distant slopes), and Kelly gets more leeches off our socks and boots. At 2035hr, 905m, just as we reach the edge of Tam Dao we spot what at first we think is T. microsquamatus (I say "big microsquamatus"), crawling off road toward high grass — it is Nikolai's new genus, informally called Pseudoboiga. It seems slow moving, barely struggles, but does spread its head. Then to the newt pond, where there are hundreds of breeding frogs (mostly P. leucomystax) and  $\geq 3$  Sinonatrix triangularis, not obviously foraging, and perhaps the watersnakes are satiated; we collect one, which later regurgitates  $\geq 1$  frog, swallowed rump first. Also check the stream 1 to staircase stretch of Upper Loop Road but saw only a few P. leucomystax, so perhaps the large numbers we saw here earlier



Greene, H.  
1997

June 15 (continued) were on their way to the ponds. Kelly showed me a big orange-bogged centipede (Scolopendria) disappearing into a hole in mossy barknet,  $\approx 2130$  hr.

June 16 Kelly and I left the hotel at 0930 hr and arrived at the trail-stream jet  $\approx 1000$  hr and lower waterfall  $\approx 1020$  hr. Partly cloudy, but some sun makes it through to the stream bed. Lots of trash, especially plastic La Vie waterbottles, but no condoms. The exact site where Ted got the T. monticola is rocky moss-covered and leaf litter, to the right of the main forest and between it and a smaller cascade  $\approx 5$  m away. I now get 730 m sl at the main pool and had set my altimeter this AM. This pool, where Mark et al. watched S. siamuligera mating, is  $\approx 3 \times 5$  m in greatest dimension. Late afternoon Dave Hardy and I handle the "Pseudoboiga" for Mark Moffett to photograph, and it readily S-coils and spreads its head, but only once bites and briefly chews my pants. Then Dave and I pose it





Greene, H.  
1997

June 16 (continued) some more, and the snake greatly inflates anterior, forms compact exaggerated S-coil (like Pseustes) and repeatedly strikes w/ open mouth (white flash); at 2005 hr on upper Zoop Rd. Dave and I see a tawny large mouse w/ white belly and long tail,  $\approx 3$  m up in bamboo and 30 cm from Stream #1, 930 m el. (Marjorie Matocq later tells us this probably a species of Niviventer). At 2035 hr, 945 m, we photograph TS #1 in arboreal posture, 30 cm above ground, head down, body extended up 15 mm  $\phi$  bamboo and anchored by tail. We check newt pond, photograph frog chorus and foam nests of P. leucomystax, but see no watersnakes. Earlier in the evening Kelly caught a Sinistratrix triangularis w/ obvious food lump, and overnight in plastic bag it regurgitated gravel P. leucomystax that had been swallowed ump first.

June 17 Leave  $\approx 0900$  hr for Old French Trail w/ Dave and Marvalse Wake, Marjorie and Mark; Teal was also on the trail and joined us from time to time.



Greene, H.  
1997

June 17 (continued) We stopped at the plank bench  $\approx 1010$ h but still too cloudy and hazy for good photos. I could actually hear birds singing and some sort of squawking duet, as well as single calls from a distance that reminded me of Juncos. We saw no herps, back to Station  $\approx 1230$ h. Nikolai gave me two female Trimeresurus moticola that hunters brought in <sup>earlier</sup> ~~the~~ <sup>in</sup> late May, the smaller in June, as well as a beautiful young Pseudoperodon barruicola he found last night in a streambed. As he predicted, when Dave Hardy and I photographed the latter this afternoon, it repeatedly and only briefly flashed a hood, which bears a crude large ocellus-like marking.  $\approx 1900$  starts to rain. Dave Wake, Majorie, and Kelly went to the newt pond & returned <sup>up</sup> in the hour because of the storm, catching a big Ichthyophis barruiculus on the stone staircase from the pond area into town. Ted was on the staircase to the tower when the storm hit and said the steps jammed into ~~to~~ and he gave up on



Greene, H.  
1997

June 17 collecting. as he came into town he  
(continued) saw a lightning flash and then the  
whole town went black - end of electricity  
in Tam Dao for a while! Also end of  
the drought, just as we prepare to leave.  
Could hear the electric storm pass by:  
first thunder after flashes 3-4 seconds,  
then some 1 sec or less, and later after  
ten seconds or more, only low distant  
rumbling. We have dinner early at  
2200hr, hearing that Nikolai and Sergei  
turned back on Old French Road due to  
flooding. Still raining hard when we go  
to sleep.

June 18 Partly cloudy, sunny, blue sky at 0800 hr,  
and the waterfall nearby sounds louder,  
cicadas buzzing.  $\approx$  1100 Kelly and I go  
up staircase to retrieve data loggers.  
At 1120 hr, "Box 24" 1175 m we retrieve  
Hobo 80340. At that site Kelly spots  
a rat walking in foliage  $\approx$  4 m above  
ground. At 1145 hr I spot a small  
lizard in the road at Stream 1, runs  
off into vegetation, pretty sure it was  
Tropidophorus hainanensis based on size,  
location, shortish tail and fringe of  
red coloration. At 1150 hr we retrieve



Greene, H.  
1997

June 18  
(Continued)

Hobo 80351 at Stream 1, 950m. at  $\approx 1200$  we are shocked to find the new pond has filled almost to the road, covering the former rock wall boundary by  $\approx 1$  m, and inundating the grassy flat where we previously laid bags etc. Thus we could not retrieve the data logger here. More photos of Polypedates leucomystax nests. After lunch everyone is in packing mode, and Natasha and Nikolai leave for Hanoi. Marjorie is sick, having had temp. of 103°F and fainted early this AM. At dusk I go w/ Kelly in chest waders into new pond, and  $\approx 1930-2030$  hr we catch 9 Sinoratrix trianguligera and miss  $\approx 6$  others, including adults and various juvenile sizes. Most appear to have recently eaten, and all spin, twist, bite, and smell terrible when seized. Pond now dominated by singing and clasping Rana macsonensis, but there are still scattered P. leucomystax and probably some Microhyla sp. (there are 3 species of Microhylids in flooded field across the road from the new pond. My





Greene, H.

1997

June 18  
(continued)

impression was that all small S. trianguliger went for the shore when chased, where as adults dived or swam toward center of pond, sometimes  $\geq 10$  m before I lost sight of them. NB: Earlier we had the big Rhabdophis chrysargus out and it performed a very Naja-like display: anterior 15 cm elevated abruptly and flattened in a cobra hood, head tilted down, and readily strikes at hands and snake bag. We had a  $\approx 2$  m Elaphe taeniura (which I will release behind the hotel) out, and it made elevated exaggerated S-coil w/ open mouth hissing, and strikes; some inflation of anterior, but not so pronounced as in the smaller E. radiata.

June 19

Dave Hardy sick yesterday w/ fever, heavy sweating, and joint aches. He checked the Primeresurus Stejegeri site and got signal from same place in ground vegetation morning of June 17 & 18 and last night, so we presume it has been regurgitated. This AM Dave is still not well, Marjorie



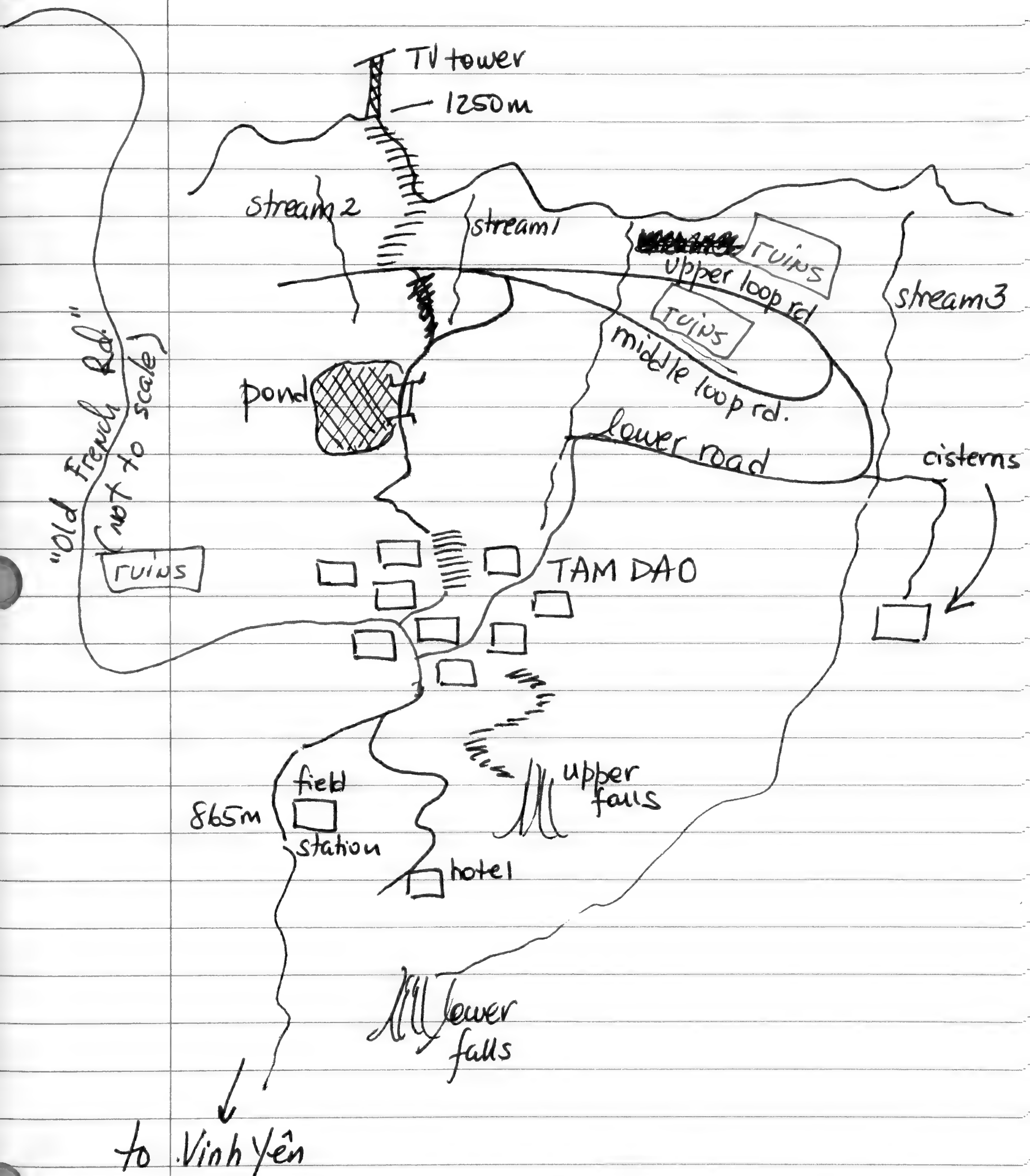
Greene, H.

1997

June 19, distinctly better. This morning spent  
(continued) packing.



# Tam Dao Canyon





|          |   | <u>Trimeresurus mucrosquamatus</u> |      |      |      |      |        |
|----------|---|------------------------------------|------|------|------|------|--------|
|          |   | (mm)                               | (mm) | (mm) | (mm) | (mm) | (gms)  |
| Sex      |   | svl                                | tail | hl   | hw   | eyes | weight |
| hwg 3007 | ♂ | 791                                | 191  | 35.4 | 19.2 | 15.3 | 84.5   |
| hwg 3027 | ♀ | 680                                | 139  | 20.4 | 17.8 | 12.8 | 68.0   |
| hwg 3062 |   | 687                                | 158  | 31.5 | 18.1 | 14.3 | 64.0   |
| hwg 3063 |   | 493                                | 110  | 23.0 | 14.2 | 10.9 | 24.5   |
| hwg 3073 | ♂ | 889                                | 127  | 40.8 | 21.6 | 16.3 | 115g   |
| T.m.#1   | ♂ | 745                                | 174  | 33.8 | 21.5 | 14.3 | 97g    |
| hwg 3087 |   | 489                                | 126  | 25.4 | 15.3 | 11.3 | 30g    |
| hwg 3086 | ♂ | 792                                | 190  | 34.5 | 20.4 | 15.3 | 104g   |
| hwg 3088 |   | 587                                | 186  | 28.2 | —    | 11.8 | 54g    |
| hwg 3091 | ♀ | 571                                | 111  | 27.1 | 16.1 | 12.2 | 40g    |
| hwg 3092 | ♂ | 741                                | 172  | 34.5 | 19.1 | 14.4 | 82.5   |
| HWG 3103 | ♂ | 531                                | 127  | 25.2 | 15.1 | 11.6 | 34g    |



You are live for sound!

|          | <u>Trimeresurus stejnegeri</u> (mm) (mm) (mm) (mm) (mm) (gms) |         |                 |                 |                 |      |       |
|----------|---------------------------------------------------------------|---------|-----------------|-----------------|-----------------|------|-------|
|          | sex                                                           | SV (mm) | tail (mm)       | hl (mm)         | hw              | eyes | wt.   |
| hwg 3000 | ♂                                                             | 594     | 149             | 30.6            | 21.7            | 16.2 | 70.5  |
| hwg 3011 | ♂                                                             | 646     | 145             | 32.3            | 21.1            | 15.3 | 89.0  |
| hwg 3028 | ♂                                                             | 580     | 152             | 29.5            | 20.8            | 15.5 | 61.5  |
| hwg 3030 | ♂                                                             | 525     | 146             | 26.4            | 19.1            | 13.4 | 43.0  |
| hwg 3032 | ♂                                                             | 464     | 120             | 24.4            | 17.0            | 13.0 | 35.0  |
| hwg 3033 | ♀                                                             | 419     | 98              | 22.6            | 15.8            | 12.1 | 32.5  |
| hwg 3034 | ♂                                                             | 540     | 139             | 26.5            | 17.8            | 12.8 | 42.0  |
| hwg 3035 | ♂                                                             | 536     | 132             | 26.0            | 17.5            | 13.7 | 44.0  |
| hwg 3038 |                                                               | 20.3    | 41.0            | 13.4            | 9.2             | 8.1  | 2.90  |
| hwg 3064 |                                                               | 360     | <del>89.0</del> | <del>20.8</del> | <del>14.5</del> | 11.9 | 18.0  |
| T.s. #1  | ♂                                                             | 565     | 151             | 30.0            | 20.0            | 16.1 | 55g   |
| T.s. #2  | ♂                                                             | 598     | 148             | 30.7            | 21.4            | 15.4 | 69.5g |
| hwg 3102 | ♂                                                             | 442     | 111             | 24.4            | 17.4            | 12.7 | 36.5g |
| mhw      | ♂                                                             | 550     | 141             | 26.4            | 17.8            | 14.8 | 68.5g |



Trimeresurus albolabris

|                         | sex | snl | tail | hl   | hw   | eyes | wt   |
|-------------------------|-----|-----|------|------|------|------|------|
| hwg 3012                | ♀   | 518 | 84   | 21.5 | 17.5 | 11.0 | 54.0 |
| hwg 3013                | ♀   | 430 | 68   | 23.6 | 14.8 | 10.3 | 30   |
| hwg 3014                | ♀   | 449 | 77   | 25.3 | 15.8 | 10.2 | 36.5 |
| hwg 3015                | ♂   | 481 | 124  | 24.9 | 15.1 | 11.1 | 40.0 |
| hwg 3026                | ♀   | 610 | 108  | 29.8 | 18.7 | 12.9 | 65.5 |
| hwg 3029                | ♀   | 410 | 114  | 23.2 | 13.4 | 10.5 | 25.5 |
| hwg 3031                | ♀   | 523 | 89   | 28.3 | 17.2 | 12.1 | 64.0 |
| hwg 3036                | ♀   | 391 | 65   | 22.0 | 12.6 | 9.6  | 27.5 |
| hwg 3037 <sup>(9)</sup> | ♂   | 361 | 82   | 19.0 | 11.4 | 9.0  | 17.5 |



Trimeresurus

manticola

|        | SVL | tail | hl   | hw   | eyes | wt. |
|--------|-----|------|------|------|------|-----|
| 3104 ♂ | 430 | 104  | 28.2 | 22.6 | 12.1 | 70g |



H. Greene  
1991-1998

Journal

1998

Arizona: Cochise Co.





Greene, H.  
1998

July 28 Portal, Cochise Co., Arizona  
I arrive here  $\approx$  0230hr, having left London (UK, homology meeting at the Novartis Foundation) yesterday AM (actually  $\approx$  2200hr Portal time on the 26th - flew London - Toronto - Minneapolis - Tucson, then our truck from Tucson to Portal; I had driven the truck here from Berkeley July 13-14 (odometer at start 119,778). I come in through Paradise and catch an ad ♀ Crotalus molossus heading S. off road at the west end of our study site (she becomes CM 35) - catch her w/ Maglite and a tube, no problem! I'm up by  $\approx$  0630hr due to jet lag, greeted by David J. Hardy Sr and Marcio Martins, latter friend w/ whom we worked in Maricao in 1993.

July 29 We roadhunt the Sistrurus area SW of here and get 3 Crotalus scutulatus.

July 30 at 0820hr, CM 31 is in a flat coil on a rock ledge under a boulder, w/ head in sun facing out to the NE, all else in shade; I sneak up to her from behind an agave and still she pulls back into shade and shelter. I scan in beside her w/ binos and see no babies. at 0940hr Marcio and I are in a ravine leading up to the saddle through which the "bandway



Greene, H.

1998

July 30  
(continued)

canyon" connects w/ our main study area (just E. of the big "Dolphin Head" rock) and see a big Scelopendra heros seemingly foraging. It is in litter among boulders in the dry stream bed, dappled sun and shade, crawling steadily and unaware of us. It swings the head here and there, disappears under a boulder for  $>1$  minute, emerges, and continues searching - moved  $\geq 3$  m in  $\leq 2$  min. At 1020 hr we see  $\geq 3$  babies at the entrance to the small cavity under a rock where ♀ CM 29 has gestated; they are in shade, coiled w/ heads pointed out, w/ CM 29 head behind them and also face out. As I come w/in  $\approx 1$  m, a baby uncoils and disappears into hole; as Marcio and I stand and take photos, ♀ 29 moves head to the entrance and over the babies. We withdraw after  $\leq 2$  min. observations.  $\approx 1400$  hr I spot an adult Masticophis bilineatus crawling into brush beside the Hardy's driveway. At 1505 hr a solid rain hits though to the east it is still sunny. We go to SWRS for dinner (Dave gave a talk on our blacktail work), and driving back, near Sunny Flat campground, a



Greene, A.

1998

July 30 (continued) small Tyrus rufus dashes across the road in front of us.

July 31 0800-0830hr we watch CMF29 in dappled sun coiled in sparse grass in front of shelter and facing it, where 3 babies are coiled. As I approach a baby uncoils slowly and crawls back into shelter. We take photos from all angles, and finally a baby out in front of the ♀ crawls over her; she flinches and partly uncoils toward the entrance. The baby crawls slowly in and she re-coils to her previous position. The skin of the babies is duller colored today (yesterday they were yellow and reddish brown, fresh looking) but their eyes are not yet blue. We decide that only 2 babies have been seen today, and I am not totally sure we saw 3 yesterday. At 0950 CM21♀ is out of sight at her gestation site, at 1100 CM31♀ is in same crack, in shade, in an open coil w/ her head part out of the entrance - her posterior is still evidently fat, and we can't see any babies. After dinner, Marcio and I road hunt the Sistrurus site. ~10 mi SW of State Line at dusk we seem to be driving into a black wall of furious cloudbank and lightning,





Greene, H.

1998

July 31  
(continued)

stretching across the Peloncillos - Chinicahua horizon, and as we pass the Gesorino Surrender marker a storm hits so dramatically I barely get us safely off the shoulder in Apache - visibility literally a meter or so, and hail. We wait it out for 20 min or so. I'd said I hoped for Brachystoma, and we got 2 A. signum crossing the road where Hg 88 meets Rucker Cyn Rd., as well as a T. marciarius and a Crotalus thox.

August 1

Mike Plummer comes by at 0700 to join us (he is studying Tenaspere on one of Joe Austin's ranches, west side of the Chinicahuas. At 0830h he and I reach site of 729. She is in the entrance, w/ an anterior coil slightly out and head on it - facing  $\approx$  2 babies that are out from entrance a few cm. As we approach they uncoil and crawl past her out of sight. At 0930h as we drive down a two-track to the park spot in a bench above Salvo Creek (this is at the big red boulder under which I once found Crotalus), we see an adult Microgaster euryanthus crawling leisurely in full sun across a 5m patch of open





Greene, H.

1998

August 1  
(continued)

gravel! As we jump out an approach it crawls rapidly, such that the color bands are confusing - as I grasp w/ tongs it cloacally plops, tucks the head in a tight bend, and waves the coiled tail laterally. At 1030h we see  $\approx 3$  babies w/in the cleft where ♀ CM 31 has been, and they slowly uncoil and retreat out of sight when we approach to 2-3 m. CM 31 is coiled  $\approx 40$  cm up the edge of the rock from her earlier site, exposed, w/head facing uphill and away from the babies! At 1145 we see CM ♀ 21  $\approx 1/3$  out of hole under her rock, as if just emerging. No babies - oops! - Marcio spots a pile of them on the E. side of the rock,  $\approx 20$  cm from ♀ 21. There are  $\geq 4$  babies! and I see one crawl over ♀ into darkness. We catch 2 for telemetry - I lay over rock, lean down, catch them w/ tongs w/ no difficulty. Billie, Dane, and I go for drinks w/ Karen and Alden Hayes late afternoon. Last night they saw a "6 foot" Pituophis ascend a tangle of rose bush beside



Greene, H.

1998

August 1  
(continued)

then carport, then cross on eves  $\geq 2m$  up to a Bendire Thrasher's nest and evidently eat the nestling - Karen couldn't even dislodge the snake by poking it w/a broom.

August 2

at 0823 we arrive at the site for CM 29 (this is a strenuous 45-60 min hike, all up) and she sits outside the entrance facing in at 2 coiled babies - and there is another C. molossus loose coiled (or frozen crawling) on a ledge 50 cm to the west! I catch her w/out problem (rattles briefly) and in the commotion Marcio tries unsuccessfully to hook the babies out for marking - they get in the hole out of sight, and CM 29 crawls in, faces out, no rattling, Dave thinks the new bizzar ♀ is follicular, but I think she feels light (despite slightly swollen abdomen) and looks "poor". She will be CM 38 (.782 mHz). at 10:50 hr we count 3 babies coiled in sun in front of CM 31; she is under the rock edge in shade, head pointing out. One baby crawls out of site as Marcio catches 2 others; ♀ 31 rattles two short bursts and maintains posture. Baby #1 (PIT 026 048258) gets



Greene, H.  
1998

August 2  
(continued)

one green dot, weighs 27.5g, and has just shed — skin very yellow and has a button. Baby #2 (PIT 026 590 589) gets two green dots, weighs 31.5g, and has gray brown colors and a prebutton. Baby #2 and the one that escaped were both pre-shed and in front of ♀31; Baby #1 was 30 cm away (to W). We return ~1100h and find ♀31 same place and a baby coiled in front of her: Baby #3 (PIT 026 791 065) has gray brown colors, weighs 28g, has a prebutton, and gets three green dots. We gently release all 3 at entrance and they crawl out of sight. ♀31 turns and tongue-flicks second baby; as the third crawls by she slowly moves to the exact position as yesterday and faces into the cavity. We spot a shed baby skin (presumably #1) in grass beside the rock, very close to where Marcio caught baby #1. At 1210h ♀21 rattles briefly from out of site as we approach and catches 2 of a pile of her 4 remaining babies, same spot at entrance as yesterday. Baby #3 (PIT 025 874 514) prebutton, 35g, 3 green spots. Baby #4





Greene, H.

1998

August 2 (continued) (PIT 026273814), 39g, prebutton, 4 green dots. We release these and Baby #1 and #2 (both w/ transmitters) and they cranted leisurely in and out of sight.

August 3 at 0820 hr, CM29 is at the entrance to her shelter, no babies visible, sun barely on the edge of her. Marcio and I retreat to shade and wait 20 min, then return to see one baby basking in front of the opening but it escapes back in. We release ♀38, and she crawls straight from the capture site ledge to CM29's hole, enters, and coils in the tight space. We are uncertain as to why she is up here - gravid? A grandniece? at 1015 CM31 is in the same place w/ her head at the front, still only one shed outside. Two dot now has light patterned is in shade  $\approx 30$  cm uphill from ♀31, and slowly crawls back in and past her as I approach. I spot posterior 1/5 of another baby w/ button  $\approx 50$  cm uphill, disappearing into thin crevice under edge of the vegetation boulder (I was puzzled that a baby w/ dark color pattern - thus not fresh shed - could





Greene, H.

1998

August 3  
(continued)

have a button, and later realized that as shedding nears the button is prominently visible through the now translucent pre-button. At 1125h, ♀21 site, I see 1-dot, 2-dot, and 3-dot plus two unmarked babies in shade of overhang. All slowly crawl in as we approach and try to catch the two unmarked babies, and ♀21 rattles briefly from out of sight in the hole.

August 4

at 0820h ♀31 is at the entrance of her shelter, head facing out, and there is a fresh shed baby coiled against her in the shade of the overhang. There is a new fresh shed, of 2-dot, in grass ~~5~~ 15cm out from rock, where I saw the baby on upper edge of rock yesterday. This baby goes back in crevice as Dave approaches to x/m and takes several photos; no response from the ♀31. At 1010h I snatch a baby from under the coil of ♀29, who is at the entrance of her site, in a tight coil. Baby #1 (PIT026606339), 1 green dot, no wt, blue eyes w/ button visible through prebutton. ♀38 signal is 3m north of ♀29, under a large



Here, H.  
1998

August 4  
(continued)

boulder. at 1135h we localize signals of ♀21 and babies 36 & 37 to her gestation site, and Dave approaches and sees 3-dot and 4-dot among uncountable babies in shade at the entrance. We see Bob Goodman (Cal Poly Pomona) at Barney Tomberlin's house, and he gives me a DOR Ophelidia aeneus from near Sycamore Canyon - in a cooler for 9 days, and I freeze it to tissue and pickle later.

August 5

at 0850h Marcio and I check ♀29. She is in the same place and posture as yesterday, coiled inside w/ her head pointing out. We see no babies or sheds. ♀38 signal is in the same site, at 1015 we locate the signal of Pituophis catenifer in Opuntia base of lower limestone rock walls in middle of study area, N of pole 3. at 1045h I get the signal of CM15 under a boulder 30m south of her July 29 flag. at 1120 we can't see ♀21 but get her signal at the site, see all babies in a pile in the shade, and catch the last two:

5-dot, PIT 026301259, 36g

6-dot, PIT 026270278, 33g



Greene, H.  
1998

August 6 We are accompanied this AM by Ron and Karen Goellner (St. Louis Zoo) and Harvey Jillywhite (U. Florida).  $\approx 0840$  after much signal confusion I locate ♂28 as he emerges on a ledge at upper edge of a small ravine (just E. of ♀21 site); from a horizontal cleft partially flooded by rat nest. First I see a smallish adult C. molossus partly out, then a larger one crawling w/it. Next they rise up (I think the smaller one 1st), intertwine, and have one or two bouts of spindling bodies (Goellner has photos). Smaller snake "escapes," crawls  $\approx 3m$  along ledge, stops. Bigger rattles, turns back into 1st hole, and smaller snake retreats to another nearby opening - I should have caught it!! There is a fresh molossus shed coming out of the 1st hole. Two possibilities: male-male combat, or, a la Schmitt ♀ provokes combat to test a ♂! at 0916h I spot CM 15 on the east side of the rock from which her signal yesterday, and she pulls under and out of sight when I approach to  $\approx 2m$ . at 0955 get signal at CM 28 site but can't see the



Green, H.

1998

August 6  
(continued)

snakes. at 1000 we get signal of CM21, 36, 37 at her site, and there is a 'basking/resting pile of babies' at the front that includes 1-dot. The babies still have opaque eyes and skins. At 1120h I get ~~of~~ CM27 signal in a big rat nest surrounded by agave, rocks & Opuntia, 4m west of his July 27 flag.

August 7

at 0810h we get only a weak poorly directional signal from CM28 from the road and see no snakes at the ledge where the possible combat occurs. We get CM27 signal from under a boulder  $\approx$  30m uphill from the ledge, causing concern that I transposed the freq. yesterday. We have also been having a puzzling (at least to me) difficulty localizing signals lately. At 0820h at the site for ♀21 we see 4-dot coiled in sun, eyes still cloudy, with button visible through translucent prebutton. We get signals for CM 21, 36, & 37 from the site. at 0940 we see CM29 in the same place and same posture as yesterday w/ three shed skins in front of entrance, including 2-dot. Signal same for CM 38.





Greene, H.  
1998

August 7  
(continued)

$\approx 1700$  we go to Douglas for dinner  
(2nd time w/in a week) at El Alamo and  
some grocery shopping. Pick up a few  
DOKs on the way home, despite bright moon.

August 8

Marcio sick & stays in. 0940 hr Dave & I  
arrive at the site of ♀29 to find  $\geq 4$  shed  
skins in front of entrance (thus one new  
~~one~~ from yesterday), and her signal  
seemingly across the saddle to the south.  
Signal of CM 38 in the same site. I see  
a baby rattler skin under bottom leaves of  
a sotol  $\geq 2m$  west of the birth site, and  
as I start to pull the skin out, see a  
neonate, fresh shed, in ambush coil  
up under leaves near base of sotol,  
facing out. Catch it w/out problems, &  
later discover its shed is among those  
in front of the birth site.  $\approx 1100$  after  
much searching Dave locates signal of  
CM 29 in dense low shrubs  $\approx 150m$  W. of  
birth site on same slope (our earlier  
reception on opposite slope thus due to  
signal bounce). At 1150 hr we get signals  
of ♀21, 36, 37 at her birth site. There  
are  $\geq 3$  babies in shade at entrance,  
no green dots visible, no sheds.



Here, H.

1998

August 8  
(continued)

After dinner I announce I will go catch a coral snake & Marcelo comes along. We drive to  $\approx 2-2.5$  miles E of Portal and on second pass (now dark, huge gold moon about to crest the Peloncillos) I see a Micruroides  $\leq 1$  m coming onto rd from the north, stop immediately, and it's gone! We search and w/in a minute find it  $\approx 3$  m N of road on open gravel. Immediately crawls fast, and when restrained w/ forceps it tucks the head, curls and waves the tail, and cloacal pops repeatedly.

August 9

at 0745h we release CM  $\sigma^7$  394. Where we locate  $\sigma^7$  39, in open brushland just E of "Boundary Canyon" and south of the road (this telemetered  $\sigma^7$  caught by Chuck Rau when birders spotted her and a  $\sigma^7$  crossing the road August 7; he later caught this  $\sigma^7$  (394) at the same site, thus perhaps the same  $\sigma^7$ ). at 0845h we check the  $\sigma^7$  29 site, finding no new sheds but 2 segments of adult rattle at the entrance. I get signal of CM 38 at the same big rock. I



Greene, H.

1998

August 9  
(continued)

the baby found yesterday under the same  
sotol leaves (NB: the skin I found near  
her is not hers, as we located this baby's  
skin - based on head pattern - among  
these from the entrance to ♀29 site.) at  
0900 Dave spots ♀38 under the boulder  
stretching out of a hole at upper east  
end. He thinks she looks skinny,  
Marcio thinks she looks fat! at 1020 hr  
at site ♀21 we get signals of her, 36, 37  
from under the rock, and Marcio sees  
3-spot and 4-spot in shade at the  
entrance. Dave sees a total of four lobs,  
and they slowly crawl in out of site, as  
he takes photos. after dark we road  
hunt and get five neonate (butter) C. thore  
w/in 2 miles E of Portal - the first yet seen.

August 10

at 0740 as we drive Paradise Road toward  
our study area, a big male (?) gopher  
crosses a hundred meters or so ahead.  
at 1000 hr all 3 transmitter signals come  
from under the rock at ♀21 site, and  
there is a fresh shed baby coiled next to  
a bunched up fresh baby skin in shade  
at the entrance! as we return to the car a  
Nephitis arbled in the ravine beside us.





Greene, H.  
1998

- August 10 (continued) after lunch I go to Tucson to pick up Kelly, and driving home on foothill rd.  $\approx$  5 miles NE Portal we miss an adult C. diox. Marcio and Dave got 8 snakes road hunting east of Portal.
- August 11 0930hr, two fresh looking babies and two sheds plus all three signals at ♀21 site. One baby slowly crawls in, recoils where still visible, and looks out. The two were originally coiled together. At 1015hr, ♂26 is out of site in a huge rat nest under a cluster of several trees, on a south terrace of Silver Creek where a flag says he was on August 5, 1957. Gordon and Jamar Schmitt arrive.
- August 12 at 0920hr, signals of babies 36 & 37 are still at site of ♀21. I spot a baby out basking, looking fresh shed but w/ piece of old skin hanging on posterior (NB: no rain in days). — it crawls back in out of sight. At 0940hr ♀21 is 40-50m south of birth site in huge rat nest in rocks and shrubs, on west rim of first ravine east of the birth site — same ravine edge & south of where I saw CM ♂28 and another snake in combat





Dave, H.  
1998

August 12  
(continued)

(with the Goellners).

at 1040h, Dave, Gordon, and I find ♀38 coiled in same site as last time, facing out. No skins or babies at site of ♀29. Just before we leave that site a big Buteo goes gliding through the saddle fairly close, carrying a living snake  $\geq 1$  m TL by its anterior end. We perceive no dorsal pattern and a light belly, perhaps gray or green dorsum - cf. Masticophis vilneisi or less likely Senticolis fraspis. The hawk glided to low on the rim rocks below Second "Dolphin Head" and landed out of sight. At 1140h, we find the signal of ♀29 in a rat nest complex in the rim of the road, at the west rim of the east fork of the big ravine by which she presumably descended from her birth site above the saddle. Dinner with Dick & Fran Zweifel.

August 13

Kelly and I left at 0700h for the Gray Ranch south of Arroyo New Mexico, returning to Portal  $\approx$  1700h just in time for dinner at SWRS. We went to the Gray Ranch by invitation to the Greater Board Meeting of the



Greene, H.  
1998

August 13  
(continued) Malpais Borderlands Group. Met in a big gray barn, with high rafters and a bat in flight at times. Relaxed atmosphere, nice lunch; saw Jim Brown, Warner and Wendy Glenner, etc.

August 14 Joe and Valer Austin, Justin Congdon, and two friends of the Austins arrived ~ 0830 hr to see the snakes, and stayed for lunch. We saw one baby at the entrance to #21 site, which slowly retreated, and got signs of bobies 36 & 37 there. Got sign of #28 in same site as when I saw him w/ the Goellners (rats have now totally destroyed/covered the *C. molossus* skin that was there). ~~Got sign of~~ Found CM #27 coiled at base of a small tree in dense grass, w/ rattle laying out from the coil, ~ a few dozen meters west of #28. We saw the edges of CM 26's big coils in the same rat nest where sign was a few days ago. Took Sherbrooke family to Douglas for dinner at El Alamo.



Greene, H.  
1998

August 15 Walked around some property nears Alden Hayes' house that his son would sell us. Alden carrying an O<sub>2</sub> rig for his emphysema, and Karen warning Kelly as we left that brush might pull the tube loose and Alden wouldn't hear it - which indeed happened. I commented that the escaping gas sounded like a rattler and Alden commented that he can't hear rattlers anymore either! Endless delays packing and leaving - Chuck Roe for lunch etc. Finally get off  $\approx 1700$  hr and make camp in Cochise Stronghold of the Dragon Mtns by  $\approx 1930$  hr.

August 16 Cochise Stronghold Campground is at  $\approx 5060'$  el. Morning clear, calm, not so hot. At breakfast an Acorn Woodpecker is chasing a nuthatch from a tree. Lots of mosquitos last night. Between 800 - 1000 hr we hunt the first  $\frac{1}{2}$  mile of the Cochise Trail, get 16 Sceloporus jarrovi and see many more, but no snakes. I took photos at 5400' el from a





Greene, H.  
1998

August 16  
(continued)

rocky east facing slope, to the NE toward Wilcox Playa and to the SE toward the crest! also saw several small striped Oreodipus. We drove out of the mountains, then south, then back over them through Middle March Pass. Bison burgers for lunch, at the OK Cafe in Tombstone. Shopping in Sierra Vista, then up a rough road to the Reef Vista Campground, el. 7200' in Carr Canyon, Huachuca Mountains. While we are having an after dinner campfire, hear a car coming very fast on the road above, seemingly lurching around turns, and see lights of a largish truck going other direction - but they don't crash! Then the offensive vehicle (maybe a pickup - 3 red hind lights, with one fairly high - roars wrong way into our campground, stops at a distant camp site, and lights out w/ no sounds for a couple of minutes, then screams out and lurches back out the road to Sierra





Greene, H.  
1998

- August 16 (continued) Vista! We wonder if they forgot something or dropped off a body, and keep the pistol loaded in the tent for the night.
- August 17 We're up to clear skies, no beardangels, and by  $\approx 0800$  hr are on the Comfort Spring Trail which goes around upper Carr Canyon through a saddle at  $\approx 7300'$  el, into Upper Ramsey Canyon. We go 2.25 miles to jet w/ Hamburg Trail at  $\approx 6700'$  el, which we think might be the Hamburg Mine site. Back to the car  $\approx 1130$  hr just in time to miss a big storm that by the time we're out of the canyon by road has engulfed almost all of the Huachuas. Got 20 Sceloporus jarrovi in Upper Carr and Ramsey Canyons, no snakes, and 3 big lion scats near each other near the jet. w/ Hamburg Trail. Upper Ramsey really is forested, w/ thick ground cover along the trail, lots of conifers, sounds of water, etc. Spectacular lichens on rock faces and the Huachuca Agave is spectacular! Oak leaves carpet the more open areas. Drive north and then west to Sonora, w/ spectacular views of storms over the



Greene, H.  
1998

August 17 over the Huachuclas, Whetstones and Santa  
(continued) Rita's. Through Tucson and up into  
the Santa Catalinas, where we stop at  
General Hitchcock Campground 5920' el.  
Kelly sees 3 S. jansoni on rocks  
behind our tent.

10829









